FEEDSTUFFS

The Weekly Newspaper for the Feed Industry

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FEEDSTUFFS *Features This Week*

RETAIL FEED CREDIT—The costs of retail feed credit in Minnesota are analyzed in an article on **page 14.**

SWINE NUTRITION—A Florida nutritionist makes suggestions on nutrient requirements of the pig in an article starting on **page 26.**

DELANEY CLAUSE—A scientist gives his reasons why he believes a change in wording is needed in the Delaney Clause. **Page 44.**

FARM TRENDS—A leading feed man comments on various farm trends and their effect in an article starting on **page 58.**

LIVESTOCK PRODUCTION—Some of the changes foreseen for midwestern beef cattle finishing over the next decade are covered in an article on **page 78.**

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Midwest Convention Views 'Wide Open' Feeding Gains Barring FDA Interference

By GEORGE L. GATES
Editor of Feedstuffs

KANSAS CITY — The Midwest Feed Manufacturers Assn. convention produced several solid predictions of what lies ahead for the feed industry and also raised some choice questions about the future.

A summary of the predictions and questions might be stated about like this: The field is wide open and promising in the area of nutritional advances and livestock and poultry management methods, provided Food and Drug Administration activities do not severely handicap progress. On the other hand, the over-all operating methods of the feed industry—who it will serve, how it will serve and with what type of products and services—are far from being clearly defined.

The knotty problems faced by the industry as a result of FDA activity, related to both the Delaney clause and enforcement procedures, were liberally aired from the Midwest platform. The subject, in fact, dominated much of the conversation in and around the Muehlebach Hotel convention facilities. Registration at the Feb. 8-9 event totaled 820, an increase from a year ago.

An explanation of FDA "white list" procedures, which have generated strong industry protests in connection with limits placed on certain feed components, was offered by Ralph F. Kneeland, Jr., of the FDA's Bureau of Enforcement.

Answer Is "No"

Following his talk, Mr. Kneeland was asked why FDA made a reference to levels for use published in the lists and whether or not this move is an attempt on the part of FDA to regulate nutrition.

Mr. Kneeland replied "no" to the second question and declared that "our concern is about safety." He added that there may be, and probably are, other uses and levels of the additives in question that are safe for use. (FDA's explanation of the "why" question is included in the summary of his talk, presented below.)

The question was put to him by Dr. J. L. Krider, vice president and director of public relations for Central Soya, Ft. Wayne, Ind., who, along with E. C. Fuller, executive vice president of Nutrena Mills, Inc., Minneapolis, conducted a question session with speakers who appeared on the opening day's program devoted to tomorrow's formulas.

Fred K. Darragh, Jr., the Darragh Co., Little Rock, Ark., was elected president of the association, and

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Illinois Conference Features Vitamin, Amino Acid Research

By DON E. ROGERS
Feedstuffs Staff

URBANA, ILL.—Research concerning vitamins E and A, amino acids, energy intake and evaluation and coccidostats relative to livestock and poultry production was brought under discussion by speakers Feb. 3-4 at the University of Illinois Nutrition Conference here.

Speakers from the host college and representatives of commercial firms made the following points in talks at the conference:

- "The interrelationships between selenium and vitamin E remain obscure. But it appears that selenium deficiency leads to certain symptoms that are specific for this element and others similar to those caused by vitamin E deficiency."
- The volatile acids produced by fermentation in the rumen are important factors in nutrition of the animal, with energy their major contribution.
- "Tryptophan and lysine are the primary amino acids required to supplement corn for swine."
- "To critically evaluate amino acid patterns, feeding of corn-soya laying diets at protein levels below the 15% level is necessary."
- "Amino acids must lower production costs to 'earn their way' into the feed formula."
- It is apparent that vitamin A deficiency in fattening beef cattle is of considerable importance.
- "More accurate data is needed on distribution of energy in swine feeds."
- "Immunity provided by coccidiosis is always 'species specific.'"
- "Glycine is one amino acid that

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Pillsbury Announces Management Change For Feed Division

CLINTON, IOWA—G. R. Peterson has left active management of the feed division of The Pillsbury Co. He will continue his association with the company as a consultant to the division.

The announcement was made by Dean McNeal, a Pillsbury director and vice president of the company's agricultural area, who has assumed general operating management of the division.

"We feel strongly that Pillsbury will be an increasingly important

(Turn to PILLSBURY, page 8)

Estimated 40 Million Tons of Feed Manufactured in the U.S. Last Year

CHICAGO — An estimated 40 million tons of livestock and poultry feed were manufactured in the U.S. last year, according to American Feed Manufacturers Assn.

Oakley M. Ray, AFMA's director of market research, made the estimate based upon the association's reporting program. Mr. Ray said 1959 tonnage was up only 5/100 of 1% from 1958. He noted that production was up 5% during the first six months of 1959, compared to year earlier levels. However, the last six months of 1959 was down 5% compared to the same period in 1958.

Mr. Ray stated that production during the first few months of 1960 is expected to continue below year ago levels. However, the outlook for the long run is upward, Mr. Ray said. He bases his prediction upon increases in human population, livestock and poultry numbers and the rate of usage of manufactured feed. He noted that output of the feed industry has climbed 40% in the last 10 years.

Regional Figures

All areas reported production at least as high as a year earlier except New England (down 2%); New York-New Jersey-Pennsylvania area (—7%); Kentucky-West Virginia-Virginia-Maryland-Delaware area (—9%), and Illinois-Indianapolis-Michigan-Ohio area (—5%). The largest increases occurred in the Arkansas-Oklahoma-Texas area (up 16%) and in the western intermountain states range area (+11%).

Production rose 6% in the Southeast. There has been an increase in this area every year for the last 11 years. Production increases have been 13% or more in five of these 11 years. The New York-New Jersey-Pennsylvania area, on the other hand, has had decreases in five of the last seven years.

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Montana Group Names Officers

By ROGER BERGLUND
Feedstuffs Managing Editor

BOZEMAN, MONT.—Ted Walters, Midland Feed Co., Billings, will serve as president of the Montana Feed Manufacturers & Dealers Assn. during the coming year.

Mr. Walters was elected president at an association meeting held here Feb. 7 in connection with the annual Montana Nutrition Conference at Montana State College. He had been serving as president for part of the past year, having moved up from the position of vice president following the resignation of the previous president.

Jim Gustin, Kalispell (Mont.) Feed & Grain, was named vice president of the association, and Pat DeVoir, Oc-

(Turn to MONTANA, page 119)

USDA Says Producers to Buy 9% Less Egg-Type Chicks in '60

WASHINGTON—The nation's egg producers plan to buy 9% fewer chicks this year than last, the U.S. Department of Agriculture reported this week. This is a more optimistic estimate than that made last week by feed manufacturers who feared that cutbacks in egg production in 1960 will greatly affect the formula feed industry. (Feedstuffs, Feb. 6.)

USDA said decreases in intended purchases of egg-type chicks are 16% in the north Atlantic and west north central states, 13% in the east north central and 7% in the south Atlantic. These cutbacks more than offset increases of 2% in the south central and 1% in the western states.

The number of layers Feb. 1 totaled 311,491,000, down 3% from the 321,292,000 counted on Feb. 1 last year. This, said USDA, was the lowest number for the date since 1938.

Decreases in layers from a year earlier were 7% in the north Atlantic and west north central states, 5% in the east north central and 1% in the south central states. Layer numbers were up 5% in the south Atlantic and 4% in the West.

USDA officials commented that

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The regional circulation of this issue is concentrated in the southwestern states

Top of the Hopper

THE MARKET RISKS of the feed business, constant downpressure on margins for both feeds and livestock and poultry products, can be solved in the long run only when such marketing essentials as longer shelf-life and brand loyalty are secured for these consumer items. This is the opinion of a number of economists and executives, both in the feed industry and outside of it.

Some feed manufacturers, it is reported, have succeeded in making arrangements for establishing firm prices with food retailers on a contract basis which enable them to come out on production costs on a planned basis. Also, there are opportunities to make such arrangements with food processors incorporating these products in such things as frozen pies. Cooperative arrangements such as these are regarded by some industry executives as a way to achieve greater stability in the feed business. Feed margins, some say, should not be regarded as the key factor in developing profits; rather, efforts should be made to achieve success on the over-all production to consumer operation, which involves such things as brand identification and adequate shelf-life as a prerequisite.

Something along this line is being approached by some grocery chains in freezing of broilers at production points rather than ice-pack shipment.

Not all manufacturers agree, of course, that the industry needs to get directly involved in food marketing, and such ideas are admittedly long-range and not easy to work out. They are being seriously considered by serious-minded men, however.

AN ALFALFA DEHYDRATOR, who also is a grain man, took the time to write a letter to Drew Pearson, the Washington columnist, the other day, and he was thoughtful enough to send us a carbon. Mr. Pearson, in case everyone doesn't know, recently took some potshots at the grain storage business (again).

Wrote John M. Allen, president of AAA Alfalfa Milling Co,. Roswell, N.M.: "The grain boys have been getting some bad publicity for several years, and according to your column you do not know all the facts. I have been in the grain business for many years. I have one installation that was erected and completed in Plainview, Texas, in July, 1958, at a cost of $250,000 cash. Capacity of 450,000 bu. The reason I am using this particular installation is I can give you the dollars and cents, income and expenses. The cost of this installation is considerably less per bushel than the average of this type. The U.S. government pays us 17¢ bu. per year storage. Now over a period of years I think you could count on about 65% capacity; however, let's use an 30% capacity, or a gross income of $61,200. Now let's deduct our expenses —such as insurance, taxes, bonds, labor, electricity, fumigants, repairs and office expense—for a total of $26,412 and depreciation for one year, on a 10-year basis, of $25,000. Yearly expenses total $51,412, so the net income is $9,788 before taxes.

"Now bear in mind there is no salary or travel expense included for the owner. Also he is under heavy bond in case this grain should go out of condition. This is a very important item and a dangerous one. I know of one company which had to purchase 60,000,000 lb. recently from Commodity Credit Corp. at market price, due to the grain going out of condition, and this can happen to any warehouseman.

"Now we have $9,788 net before taxes, which is a fraction less than 4% on the investment. Now by any reasonable measure of income we should get at least 20¢ bu. per year, which would give us 8% plus, on our invest-

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How's Business?

AN EVERY WEEK REVIEW OF FORMULA FEED BUSINESS VOLUME, INCLUDING PRICE, SUPPLY AND DEMAND TRENDS

It was quite evident this week that formula feed manufacturers around the country were running their plants somewhat below capacity. Demand for manufactured feeds continued slow because of mild weather in most parts of the nation and because of discouragingly low prices paid producers for most animals. The situation is expected to improve to some extent about March 1 when it is hoped the spring feeding season will bring about a revival of interest in manufactured feeds. Feed ingredient supplies were more than adequate during the week and prices were again adjusted downward. The wholesale feedstuff price index dropped 1.3 points in a week to 79.2 as of Feb. 9, compared with 89.2 a year earlier. The feed-grain index, however, was little different from a week or a year ago, and stood at 64.9 Feb. 9. The hog-corn ratio, based on Chicago prices, was 11.5 this week—slightly below 11.6 the previous week, but still well below 13.9 a year earlier. (Feed markets in detail on pages 120-122.)

Northwest

Formula feed prices continued downward in the Northwest this week. Most manufacturers reported that business was as slow, and in some cases slower, than last week—and behind last year at this time. They also reported that their mills are running well below capacity and some have cut back their operations to four days a week.

Though there are no definite indications, feed men believe business will start picking up late this month. Some feel that turkey starter feed business will come up and hog feed business may improve along with somewhat better hog prices.

For the present, anyway, it appears that manufacturers aren't optimistic about the feed business for the rest of the month.

Feed ingredient supplies were more than adequate during the week and prices again were adjusted downward.

Southwest

Formula feed business this week was a weak imitation of last week in the Southwest. Dominant factors in the sluggish business are the seasonal slump usually encountered in February and the burdensome supplies of wet corn being fed.

Reports from formula feed manufacturers were generally pessimistic about near term business. Hog feed sales were steady for the week as were dairy and laying rations. Some trade sources reported improved broiler feed business for the week. There were scattered reports of both chick and turkey starter feeds beginning to move, but the extremely poor returns on eggs tend to dampen any optimism in this line. The running time of mills in the area was again 4-5 days and slow.

Along with weaker ingredient prices was a weak milo market. A fairly sharp break in all vegetable proteins will cause price lists to be pared a little more.

Northeast

There was little incentive for consumers to buy formula feeds and sales continued to lag. Although prices of end products weren't too bad, there was nothing in the picture to stimulate sales and most ingredients drifted lower.

Egg prices picked up a little but "they're still not too good" and it's not known whether they will be able to sustain the rise. Broiler prices edged off an average of one half cent a pound in the East and dairy products held about steady.

Some of the disappointing sales tonnage results from the loss of broiler and egg markets in this region to other sections of the country.

The sales pattern remained unchanged during the week, with dairy concentrates leading the way, followed by egg mashes and to a much lesser extent by broiler feeds.

Southeast

All types of feed business in the Southeast are reported as being unchanged in some sections, and a little slower in others. Running time with the mills on poultry feed continues about average, with a slight cutback on other types of feeds. The demand for broiler feeds has not increased as many had expected, even though broiler prices remain good at 17½¢ to 18¢ per pound f.o.b. the farm.

With the slow demand and feed ingredient buyers continuing to buy their major proteins more or less on an as-needed basis, cottonseed meal and soybean meal continue on the weak side. Cottonseed meal is now selling between $7@8 ton cheaper than soybean meal and many manufacturers of dairy feeds are contemplating switching entirely to cottonseed meal.

The demand for corn is only fair and it can be bought at around $1.35 bu. delivered most Georgia points, which is down 2@3¢ bu.

Many of the citrus pulp processors will be closing down the last of next week and will cease operations until the latter part of March when the Valencia oranges are ready to be processed. This will result in tightness of citrus pulp and some processors are not accepting any orders for shipment after Feb. 20 at the present asking prices which are firm at $32.50, f.o.b. Florida producing points.

Central States

For just about the first time since the turn of the new year, most manufacturers of commercial mixed feeds were able to report a modest broadening in demand for their product during the week just preceding. A few were advising that while their volume of sales was only slightly larger than during the previous week, at least they had not lost any further ground. And there was somewhat more of a spirit of at least subdued optimism noted than at any time since just ahead of the year end hoildays.

Generally speaking, backlogs of orders were building up just a trifle, which in itself is an encouraging development, even though, percentagewise, they did not bulk up to any great extent.

The improvement seemed to be apparent in feed lines generally and

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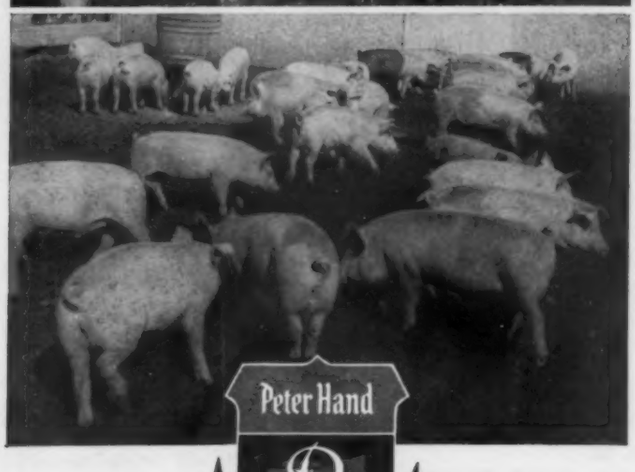

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Chemical Industry Spokesmen Voice Views Opposing FDA's 'Broad Powers'

By JOHN CIPPERLY
Feedstuffs Washington Correspondent

WASHINGTON — Chemical industry spokesmen appeared this week before the House Interstate and Foreign Commerce Committee to set forth their views in opposition to broad grants of power to Food & Drug Administration to ban use of chemical additives under the provisions of the Delaney Amendment. This, under present FDA policy, halts new uses of such products as estrogens in expanded use in animal feeding.

Speaking for the Pharmaceutical Manufacturers Assn., Thomas P. Carney, vice president, Eli Lilly & Co., Indianapols, Ind., said, "The rigidity of the Delaney Amendment is stifling agricultural research."

In 1958, Congress enacted a ban on the use of cancer-producing products in food and animal feeds, if it had been shown that the use of such products had produced cancer in test animals. At this time, under instructions from Arthur S. Flemming, secretary of Health, Education and Welfare, FDA is asking Congress to extend the provisions of the Delaney Amendment to a color additives bill now pending before Congress. This amendment was approved by the Senate at its last session, but without the Delaney amending clause. The Senate declined to contain this clause in its bill, since, at that session of Congress, FDA officials opposed the inclusion of that amendment on the grounds that it was difficult, administratively, to enforce.

Now, under the leadership of Mr. Flemming, his subordinates have been instructed not to oppose the Delaney clause in the House Color Additives Bill, but to advocate it.

Urges Modification

Mr. Carney urged the House Committee to modify the 1958 amendment and to reject the Delaney provision in the Color Additives Amendment to permit FDA to have the authority to determine safe residual tolerance levels for the compounds which the Delaney clause bans.

Mr. Carney noted that an extreme interpretation of the Delaney Amendment provisions could ban the consumption of milk, eggs and sugar, since, under certain circumstances, it can be demonstrated that they might induce cancer in test animals. It may be recalled that when Mr. Flemming appeared before the committee, he admitted that even sunlight was known to produce cancer.

Dr. Carney also said that this rigid clause "Eliminates the element of scientific judgment in evaluating additives in food, drugs, and cosmetics. Thereby, it takes the job of establishing safe limits for chemicals out of the hands of the Food & Drug Administration, where it rightfully belongs."

He urged Congress to avoid rigid legislative edicts and to permit FDA "To apply careful scientific judgment in ruling on the safety of specific chemical additives."

The Pharmaceutical Manufacturers Assn. proposed a modification in the Delaney Amendment as it now appears in the House Color Additives bill and in the Food Additives Act enacted in 1958. This amendment would then read, in part:

"A color additive shall be deemed unsafe . . . if the additive is found, in amounts and under conditions reasonably related to the intended use, to induce cancer when ingested by man or animal . . ."

This modified wording would permit FDA to consider all additives in the light of their dosages and actual conditions of use, said Dr. Carney.

In illustrating the "unrealistic re-

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CAPITAL COMMENT

By JOHN CIPPERLY
Feedstuffs Washington Correspondent

Wheat Legislation

Wheat legislation this congressional session has little better than a 1-3 chance of enactment according to reliable information reaching Feedstuffs here after the delivery of the White House Farm Message to Congress this week.

One influential GOP farm spokesman on Capitol Hill said, "It was a sweet message." Meaning, as he later explained, it offered little if anything new and so circumscribed legislation which would be approved that it ended any chance of wheat legislation this session.

In the meantime, on the House Democratic side, a leading farm Congressman, Robert Poage of Texas, introduced a bill embodying the Brannan Plan production payment proposals when crop prices fell below levels of support. However, the Poage proposal would eliminate acreage allotments and marketing quotas on wheat.

The Poage proposal is another one of several—all with different viewpoints of politicians after the farm vote.

South Soybean, Grain Shippers Meet Feb. 17

MEMPHIS, TENN. — The annual mid-winter meeting of the Mid-South Soybean & Grain Shippers Assn. will be held Feb. 17 at the Hotel Claridge here, beginning at 10 a.m.

Ross Milner, extension economist in grain marketing at Ohio State University, will speak on "Making Your Business Better."

A report will be given by Dave Farlow, assistant to the executive vice president of the American Soybean Assn., on the two main problems on soybean exports to Japan. These concern the morning glory seed and automatic allocation of imports, an association official said.

The afternoon session will be an area meeting on the progress of and problems facing the grain warehousemen in negotiations of a new Uniform Grain Storage Agreement with the Commodity Credit Corp. Walter Blanton, Blanton Grain Co., Carrollton, Texas, will be in charge of this session.

Albert R. Cravens, Caruthersville, Mo., association president, has called for a board of directors meeting at 4 p.m. Feb. 16.

Washington Group Elects President

YAKIMA, WASH. — Walter Van Horne, J. W. Feed Co., Burlington, was elected president of the Washington State Feed Assn. as the group held its annual convention here Feb. 12. Mr. Van Horne succeeds Russell Wriglesworth, General Mills, Inc., Tacoma, as head of the group.

Other officers elected for the coming year are: Arthur R. Hill, Arthur R. Hill Co., Inc., Seattle, vice president, and Mel Erickson, Nordquist Feed Mills, Redmond, secretary-treasurer.

The convention followed the Pacific Northwest Feed Mill Production School which took place Feb. 10-11 in Yakima. About 150 feed men attended the production school. (Reports on the school will appear in subsequent issues of Feedstuffs.)

AFMA Board Okays Addition of Member To Executive Staff

CHICAGO—The executive staff of American Feed Manufacturers Assn. will be enlarged for the second time in two years. The addition of a man qualified to handle specific responsibilities in areas of nutrition, feed control and states relations was authorized recently by action of the AFMA board of directors.

In reporting February action of the board, I. S. Riggs, chairman, the Quaker Oats Co., declared this week, "Additional manpower is needed to more adequately serve our rapidly expanding membership, and to attend more properly to the increasing number of problems of state and federal origin.

"With the election of 130 new AFMA members during the past eight months, we now have our greatest membership in history and can speak for more than 75% of the nation's formula feed tonnage. This ever-widening base of AFMA support has enabled the association to expand its program of service without increasing the cost of dues," Mr. Riggs added.

"Some realignment in current staff responsibility will be made when the new program gets into operation. Our target date is May 1, 1960, which is the beginning of AFMA's 52nd year," Mr. Riggs said.

The duties of the new staff member will include work with feed control officials, state legislators, the U.S. Department of Agriculture and college nutritionists, the AFMA Nutrition Council and Feed Control Relations Committee, expanding present programs in these areas. His activity will not include feed formulation service, however.

W. E. Glennon, AFMA president, has announced that interviews for the new position will be arranged soon. He observed the most promising candidates will be young men with experience and/or knowledge in areas of nutrition and registration of formulas.

Prices of Feedstuffs Continue Downward

WASHINGTON—The feed market continued its downward trend with prices of all feedstuffs averaging 95¢ ton lower for the week ended Feb. 9, the U.S. Department of Agriculture notes.

USDA points out in a weekly feed market news bulletin that supplies proved fully adequate for trade needs as buyers "lacked enthusiasm and were extremely price conscious." Purchases were limited almost entirely to short-term requirements.

Trading continued slow, reflecting the general lack of formula feed business and the widespread tendency of feeders to use high-moisture corn and other home-grown feed grains. Dairy feeds remained the best movers, but some improvement was noted in hog feed sales. Trading in poultry feed continued dull.

Oilseed meals were under selling pressure with supplies adequate to burdensome for slow demand. Average prices dropped $1.30 ton for soybean meal. Cottonseed and linseed meals weakened slightly, copra meal was unchanged and peanut meal went down $1.

Animal proteins continued to give ground influenced, in part, by the downturn in soybean meal. Other weakening factors were liberal offerings and slow demand. Average prices were down $1.35 ton for meat meal, $1.60 for tankage and $1.50 for fish meal.

Wheat millfeed markets remained dull, largely as a result of relatively poor movement of formula feeds. Although production of 97,400 tons of wheat millfeeds for the week ended Feb. 9 was down slightly from the previous week's outturn, offerings were burdensome.

Tighter Inspection Of 'Suspect' Cattle Ordered by Department

WASHINGTON—To prevent misuse of stilbestrol by cattle feeders, the U.S. Department of Agriculture this week ordered its meat inspection service to tighten inspection of cattle appearing at markets if it was suspected that they had not fully complied with Food & Drug Administration restrictions that stilbestrol must not be used in cattle feeds within 48 hours prior to slaughter.

It was said that this is primarily a precautionary measure since previous agricultural problems involving the use of chemicals in food production have revealed that in some instances "farm producers have failed to comply with the directions as to use provided by the manufacturer of the chemical products."

USDA meat branch officials say they have had no evidence that beef cattle have been coming to slaughter containing any residue of stilbestrol in the animal. When cattle are received at slaughter points where it might be reasonably expected that they could have obtained feed rations containing stilbestrol within 48 hours of receipt at the slaughter inspection point, they are being held for an additional 48 hours to assure that the FDA requirement is met.

• • •

Proper Withdrawal Urged at Feeder Event

KANSAS CITY—"The evidence indicates that when stilbestrol is used in accordance with precautions recommended by the Food & Drug Administration of this department and incorporated on the labels of stilbestrol preparations, it leaves no detectable residues at time of slaughter in the meat of treated animals. In view of this fact, we are taking no action to interfere with the use of stilbestrol for this purpose."

This statement, made by Arthur S. Flemming, secretary of the Department of Health, Education & Welfare, was quoted by Rep. Larry Brock (D., Neb.) at the National (formerly Corn Belt) Livestock Feeders Assn. annual meeting here Feb. 11. The statement was made by Mr. Flemming Jan. 27 in a letter to Mr. Brock, who requested the latest information on the subject from Mr. Flemming.

Mr. Brock also said Mr. Flemming emphasized in the letter that the directions for use of stilbestrol in feeding beef cattle include a 48 hour withdrawal period before slaughter. "This withdrawal period must be rigidly observed by those who employ the compound," Sec. Flemming told Rep. Brock.

Dr. M. R. Clarkson, associate administrator, Agricultural Research Service, U.S. Department of Agriculture, made these comments at the Kansas City meetings:

"There is a very simple admonition we must observe in using drugs, pesticides and feed additives for livestock—'Use Chemicals Safely—Follow the Label.' This must be done. You must do it. You must help see to it that others do it. The integrity of your industry depends upon it.

"Clearances of chemical usages are given on the basis of effectiveness as well as safety. There is no gain in misuse. There is only extra expense, often a loss of effectiveness, and a chance of real trouble.

"Public controls of chemicals and other factors affecting food are here to stay. If anything, they will be made more stringent."

EXECUTIVE KILLED

JAMESTOWN, N.Y.—Daniel G. Grandin, 45, milling company executive, was killed in a conveyor at the grain elevator here.

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To Build $500,000 Montana Feed Plant

GREAT FALLS, MONT. — Montana Flour Mills Co. has announced that it will build a half-million dollar feed plant adjoining its country elevator in Great Falls. Construction is scheduled to start about April 1, with completion anticipated not later than Oct. 15.

C. G. McClave, president of the firm, said the new plant "will be equipped with modern electronic facilities for controlled accuracy and uniformity in meeting the exacting requirements necessary to the manufacture of quality feeds." He noted also that the plant will have a mixing capacity of 30 tons per hour and a pelleting capacity of 10 tons per hour. "Provision has been made so that pelleting capacity can easily be doubled, if necessary, by the installation of a second pellet mill," he said.

Additionally, plans call for a steam-roll unit and a farm store and warehouse. The steam-roll, to be installed in the east end of the company's elevator, will have a capacity of 10 tons per hour and will be provided with facilities for the addition of liquid molasses and other supplements. The new farm store and warehouse, which adjoin the feed plant, will make it possible for the company to carry larger, more complete stocks of feeds, seeds and allied supplies than in the past.

Further, said Mr. McClave, the company, for the first time, will be in a position to serve the community with retail services on lawn and garden supplies and equipment.

Hogenson Construction Co., of Minneapolis, holds the contract.

Montana Flour Mills Co. has recently built new elevators at Joplin and Havre, purchased a feed plant at Missoula and made substantial increases in grain storage capacity at Great Falls, Bozeman and several other locations.

According to H. C. Johnson, vice president in charge of the formula feed division, "provisions for accuracy, uniformity, flexibility and efficiency keynote the design of the new plant." Millfeed is air-fluidized in the flour mill and pumped through a pipe to the battery of ingredient tanks in the feed mill. Feed grains and other bulk ingredients are received by truck over a 50-ton, 60-ft. scale capable of handling the largest of such units.

Nerve center of the mill is the Hardy batching scale. Actuated by an electronic panel, this unit will automatically draw, weigh and mix all ingredients in a batch formula. It can be set to run a formula repetitively or to run it a certain number of times and then change to a new formula.

Finished feed moves first to bulk storage bins from which it moves by conveyor to bulk trucks or to a high-speed packing line. Sacked feed will be handled by fork-lift trucks and pallets.

USDA Buys Dried Whole Egg Solids

WASHINGTON—The U.S. Department of Agriculture has announced purchase of 1,188,525 lb. of dried whole egg solids in No. 2½ cans. The eggs will be distributed to schools and needy persons.

USDA accepted offers from all 10 bidders at prices ranging from $1 to $1.0257 lb. About $1,209,000 of Section 32 surplus removal funds were spent for the purchase.

The 10 firms offered a total of 1,323,075 lb. in No. 2½ cans. No dried eggs were offered in No. 10 cans. Shipment is scheduled Feb. 19 through March 5.

Purchases since the program began total 3,947,100 lb. of dried eggs at a cost of approximately $4,009,000.

GEORGIA'S '59 EGG-TYPE HATCH ABOVE 1958

ATLANTA, GA. — Georgia hatcheries produced 27% more egg-type chicks in 1959 than in 1958, according to the Georgia Crop Reporting Service.

Total production of egg-type chicks in 1959 was 15,737,000, compared with 12,369,000 produced in 1958.

However, for the U.S., there was an 8% decrease in egg-type chicks produced. Total production in 1959 was 545,657,000, compared with 596,340,000 in 1958.

Former President Of Exchange Dies

MINNEAPOLIS—John T. Culhane, retired district manager of Spencer Kellogg & Sons, Inc., and a former president of the Minneapolis Grain Exchange, died Feb. 4. He was 71 years old.

In his 37 years with the company, Mr. Culhane is said to have purchased more flaxseed than any other person at the Minneapolis exchange. He retired six years ago.

Born at Superior, Wis., Mr. Culhane started his career as a messenger boy when he was 16 years old. This job was with the Great Northern Railway Co. in Duluth. His first job as a grain man was with the William Dalrymple Grain Co. in Duluth. He was a clerical worker until he joined Spencer Kellogg and became a member of the Duluth Board of Trade. He was transferred to Minneapolis in 1924.

Mr. Culhane was president of the Minneapolis Grain Shippers Assn. in 1945, commander of the Grain Exchange American Legion post in 1940 and former vice chairman of the flax development committee of the Flax Institute of the U.S. He was also a member of the Knights of Columbus.

Co-op Taxing Policy Change Asked by Group

WASHINGTON—Another demand that cooperative corporations be taxed on their income in the same manner as other corporations has been voiced by the Grain & Feed Dealers National Assn. Spokesman for the association was Roswell Magill, nationally known tax authority, who appeared before the House Ways and Means Committee.

Targets for attack are the patronage dividends which are a feature of cooperative policy and which are not taxable. Mr. Magill says tax regulations permit approximately $400 million of the net income of cooperative corporations to escape federal income tax.

"Taxation of this income would not only produce an estimated $150 million to $200 million of needed revenue for the government but would remove a tax inequity which now gives cooperative corporations an important competitive advantage in buying and selling agricultural commodities and supplies," Mr. Magill declared.

The estimated gross business of these farm cooperatives, he said, was approximately $13.5 billion in 1957 and has probably increased to $15 billion at the present time. The estimated $400 million net margins earned by cooperatives represent less than 3% of this gross volume of business, a return below that estimated in 1957 by the Farmer Cooperative Service, a U.S. Department of Agriculture agency. The revenue loss estimate therefore is believed to be very conservative.

G. A. THOMPSON DIES

MANCHESTER, N.H. — George A. Thompson, manager of the former Annis Flour & Grain Co., died at a hospital here Feb. 3. He had been a resident here for 55 years.

USDA Offers Purchase Of Additional Poultry Treated with Stilbestrol

WASHINGTON—The U.S. Department of Agriculture has offered to purchase 2,630,000 lb. more of frozen ready-to-cook poultry which have been treated with diethylstilbestrol, subject to vendors' acceptance.

These purchases, being made in accordance with the purchase program announced Dec. 11, 1959, are in addition to the initial 1,195,700 lb. of stilbestrol-treated poultry USDA offered to buy on Jan. 20.

Contracts are being mailed to persons or firms who offered the poultry, and will become valid when they are signed and returned to the poultry division, Agricultural Marketing Service, USDA, Washington 25, D.C.

Prices of the offers ranged from 20¢ to 45¢ lb., averaging 43.51¢. Factors which account for the wide price range include: variation in prices of live poultry, date of processing, processing costs, weights, quality, services performed and storage rates.

USDA is reviewing additional offerings postmarked no later than Jan. 31, the final offering date.

Group Guilty of Egg Price Manipulations

WASHINGTON—A Chicago group found guilty in U.S. Department of Agriculture administrative proceedings of manipulating egg prices in violation of the Commodity Exchange Act has withdrawn an appeal previously filed in the U.S. Circuit Court of Appeals in Chicago and has been deprived of all market privileges, effective Feb. 10, USDA reported this week.

Those involved are Fox DeLuxe Foods, Inc., a Chicago wholesale egg and poultry dealer and registered futures commission merchant; Harold W. Fox and Bert E. Fox, who were vice presidents and directors of the corporation and registered floor brokers at the time of the manipulation, and Roland N. Gergen, secretary, and later executive vice president of the corporation.

A decision and order of the department's judicial officer, Thomas J. Flavin, issued on June 26, 1959, found that the respondents manipulated egg futures prices and prices of cash refrigerator eggs in December, 1953, and January, 1956. This order, which was stayed pending appeal by the respondents to the federal court, imposes sanctions as follows:

"The registration of Fox DeLuxe Foods, Inc., as a futures commission merchant and the registration of Harold W. Fox as a floor broker are revoked, and the registration of Bert E. Fox as a floor broker is suspended for a period of three months.

"All trading privileges are denied to Fox DeLuxe Foods, Inc., Harold W. Fox and Roland N. Gergen for a period of one year and to Bert E. Fox for a period of six months, such denials to apply to all trading done and positions held directly and also to all trading done and positions held indirectly through persons owned or controlled by any of the respondents."

Portland Officers

PORTLAND, ORE.—Andy Nielson, Westfal-Larson Co., has been named president of the Portland Merchants Exchange Club for 1960. Other officers are W. H. Fisher, Cargill, Inc., vice president, and John Sarsfield, Cargill, Inc., secretary-treasurer.

Board of directors are Maury Lessing, Louis Dreyfus Corp., and Herbert Bals, Bakke Steamship Corp. L. C. Fowler will continue as assistant secretary and E. K. Farr was reappointed assistant treasurer. Joe Gabrielson will serve as bar manager and W. A. Richards is chairman of the house committee.

GTA to Build Mill At Edgeley, N.D.

MINNEAPOLIS — Farmers Union Grain Terminal Assn. has plans for erecting a semi-automatic feed mill with a production capacity of 20 tons an hour at Edgeley, N.D., it was announced this week by Emil Loriks, GTA president.

The mill, which will supplement the million-dollar feed plant now being built by GTA at Ellis, S.D., is being designed to serve farmers within a 100-mile radius of Edgeley, he said.

The new mill is in the planning stage and a date for construction to begin has not been announced.

Mr. Loriks reported that the decision by GTA directors to build at Edgeley was influenced by the findings of a survey made by the U.S. Department of Agriculture's co-op service division, which analyzed information relative to North Dakota's feed requirements and most desirable feed plant locations.

A. H. Roffers, manager, GTA's feed division, said the new plant will be of the type which will serve a restricted area and "will make the greatest use of local feed grains and minimize transportation costs."

Initially, the new mill will have one pelleting unit. Another is to be added later.

Oilseed Meal Futures Stronger at Memphis

MEMPHIS, TENN. — Oilseed meal futures generally moved upward during the past week, with a turn to the top side after earlier being lower on the Memphis Board of Trade.

Reports of shutdowns helped firm the market, while a bigger advance was held back by continued slow cash market business.

Conversion of soybeans into products remained on a poor basis, pit observers said. This added to the price-holding movement of products around current levels unless soybeans can be purchased at a lower figure.

Reports Feb. 8 of shutdowns brought the modest upswing to oilseed meal futures.

Cash brokers said that oilseed meal was being bought only for car requirements. Buyers, they added, were holding off future purchases with expectation of still lower prices.

Memphis basis soybean oil meal closed Feb. 9 25@50¢ ton higher than on Feb. 2, unrestricted soybean oil meal was unchanged to 95¢ higher and bulk solvent cottonseed oil meal was 25¢ higher to $1 lower.

Trading volume for the period amounted to 1,500 tons of unrestricted soybean oil meal and 500 tons of bulk solvent cottonseed oil meal.

Cattle Shipments Into North Central Up 14%

WASHINGTON — Stocker and feeder cattle and calves shipped into nine selected north central states during 1959 totaled 6,479,927 head, compared with 5,691,689 during 1958 —a 14% increase.

The U.S. Department of Agriculture said that of the total cattle and calves received during 1959, 2,650,719 head came through public stockyards and 3,829,208 were received direct.

States where inshipment records are available include Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, South Dakota and Nebraska.

Stocker and feeder sheep and lambs shipped into the nine states during 1959 totaled 3,058,518 head, compared with 2,936,280 during 1958 —a 5% increase. Of the total sheep and lambs received during 1959, 1,078,640 head came through public stockyards and 404,251 were received direct.

Quarter Century Of Dannen Mills Growth Observed

ST. JOSEPH, MO. — Around 150 grain and businessmen and civic leaders attended a luncheon at Hotel Robidoux recently as Dannen Mills, Inc., celebrated the 25th anniversary of its entrance into the feed business.

The business, started by the late H. L. Dannen with one employee, now has a payroll in St. Joseph alone of more than 400 persons. Its original storage capacity here was 40,000 bu. Today the St. Joseph storage is past the 10 million bushel mark.

The Dannen enterprise, the audience was told, had its foundation on $2,000 borrowed on a life insurance policy to start a hay and grain commission business.

"Agribusiness"

Dwight L. Dannen, son of the president and now the head of the firm, told of the importance of "agribusiness" to St. Joseph and the nation. "Agribusiness" was defined by Mr. Dannen as the combination of food production, processing and distribution operations.

"Agribusiness," he stated, "is the nation's largest business, making up 37% of the working force of the U.S." The vast changes made in farming methods through research, education and application of mechanical power have caused a virtual agricultural revolution during the period since the Dannen enterprise was launched, Mr. Dannen said.

Efficiency Growth Cited

"In the past 25 years, farmers have boosted their efficiency as much as in the preceding 120 years. Farmers today are using three times as much machinery and over twice as many motor vehicles as they did in 1940. Today's farmer produces as much in one hour as he did in two hours in 1940 and in three hours in 1910," he stated.

A visual review of the company, presented with slides, depicted growth of the Dannen firm. That progress was achieved, the audience was told, despite fires, explosions, floods and even a tornado which, from time to time, damaged or demolished various company installations.

In addition to facilities in St. Joseph, Dannen also operates 24 elevators in Iowa, Missouri and Kansas, a feed manufacturing installation at Milliken, Colo., and wholesale operations at Omaha and Denver. The company is a member of boards of trades at St. Joseph, Kansas City, Omaha, Chicago, St. Louis, Hutchinson and Wichita, Kansas.

Northeast Poultry, Egg Workshop Set

WASHINGTON, D.C. — Marketing, procurement and mark-ups on eggs, along with egg and poultry price reporting, broiler operations and coordination among cooperatives will be among the topics under discussion at the Winter Business Management Workshop of the Northeastern Poultry Producers Council Feb. 25-26 at the Willard Hotel. This program is co-sponsored by the Farmer Cooperative Services of the U.S. Department of Agriculture.

A panel will discuss "Experiences with Broiler Operations" on the opening morning. T. C. Morrison of the University of Connecticut also will speak during the morning on "Market Orders for Eggs and Poultry." A discussion will follow.

"Should Chain Stores and Cooperatives Compete in Egg Procurement?," "Coordination Among Cooperatives Regionally and Nationally" and "Are Retail Egg Mark-ups Too High?" will be among the topics on the afternoon program.

"Improving Egg and Poultry Price Reporting" will be discussed the morning of the second day.

Blast Damages Roof Of New York Mill

JAMESTOWN, N.Y.—An explosion recently blew out the roof of the six-story building of the D. H. Grandin Milling Co. here.

Daniel Grandin, company vice president, said he doubted the damages would exceed $20,000.

No one was hurt in the explosion which was followed by a fire that flashed through the building.

According to the fire department, the explosion occurred in the hammermill area, the force going up a grain elevator shaft to the sixth floor where the roof was blown out. Walls on that floor were also damaged.

The explosion was believed to have been caused by an accumulation of dust in the elevator.

Poultry Firm Builds Processing Plant

JACKSON, MISS. — Groundbreaking ceremonies were conducted here by State Poultry Co. for a new poultry processing plant.

The new plant, costing $205,000, will have a production capacity of 3,000-5,000 broilers per hour.

The company was formed by the merger of Hamblin Poultry Co. and Sanitary Poultry Co., both of Jackson. The owners of both companies decided after several months of preliminary discussions that they could "provide better services at a more reasonable rate by operating together with a reduced duplication of operations."

The six principals involved in the new firm are: Roy Hamblin, president; W. A. Clements, executive vice president; Paul Summers; Grady Stringer; J. E. Simon, and J. P. Clements.

Annual payroll of the company will be an estimated $350,000.

C. C. Fuller J. K. Groff

Beacon Milling Makes Two Appointments

CAYUGA, N.Y. — Appointments of Clayton C. Fuller as production superintendent of the Cayuga plant and J. K. Groff as assistant Delmarva area manager for Beacon Milling Co., a division of Spencer Kellogg & Sons, Inc., have been announced.

Mr. Fuller will be responsible both for current production and for developing plans for that plant to meet the changing and expanding needs of dealers and feeders. He is currently responsible for production and office activities at the firm's plant at Laurel, Del.

Mr. Groff, who will be headquartered at Laurel, Del., will work with James W. Moyers, area manager, and will share in the responsibility for all phases of the company's activity on the Delmarva Peninsula. He is a graduate of Franklin and Marshall College, and joined the firm in 1951 after three years experience in agricultural sales for an equipment manufacturer.

HAROLD BACON DIES

EL CAJON, CAL.—Harold Bacon, 73, past president of the California Hay, Grain & Feed Dealers Assn., died recently.

Illinois Firm Building New Feed Mill

GENESEO, ILL.—A new half million dollar feed plant is being erected here by Columbian Feed Company of Illinois, an affiliate of Columbian Hog & Cattle Powder Co., Kansas City.

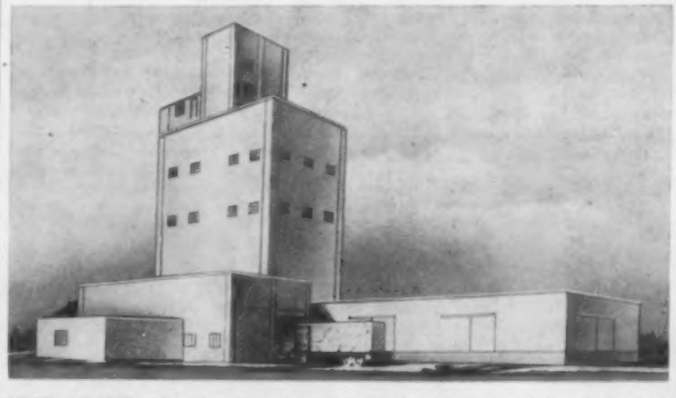
According to Frank R. McDermand, president of Columbian, the mill is being constructed by Roberts Construction Co., Sabetha, Kansas.

Storage capacity for more than 50,000 bu. grain directly over the driveway and additional storage for 20,000 bu. over the 5,000 lb. batch mixer is included. Eight carloads of bulk oil meals and concentrates can also be stored. There will be a total of 40 different ingredient bins. Some 12,000 gal. molasses and 4,000 gal. animal fat can be stored in the basement.

All operations will be controlled at a master push button panel. There is a printomatic roll tape on the scale dial which is coded for each material and will be used for permanent batch records.

Equipment will include ear corn shellers, a 75-hp. Prater hammermill which features granular grind and drying equipment, oats huller and scalping equipment. A 100 h.p. multi-duty pellet mill will be equipped with crumblizing and molasses adding equipment and will have a capacity of 12 tons hard pellets or 6 tons high molasses soft pellets per hour. A 100 h.p. Wenger Scotch marine boiler using a natural gas power burner will supply the steam for the pelleting.

The mill building, independent of office or storage space, is 55 by 33 ft. and will be served by a double driveway. The feed storage warehouse is 96 by 33 ft. and is provided with both truck and rail unloading facilities.



FEED PLANT—Here is a drawing of the new half million dollar feed plant being erected at Geneseo, Ill., by Columbian Feed Company of Illinois. All operations will be controlled at a master push button panel.

Symington Actions Hit by Ohio Group

WASHINGTON—A group of Ohio grain dealers and elevator operators arrived in Washington this week to protest implications by Sen. Stuart Symington (D., Mo.) that grain storage operators are making excessive profits.

The group called on all Ohio congressmen and senators to "place the record straight" and to dispute Sen. Symington's charge that the grain storage operations yield as much as 167% profit per year on cost.

A seven-member group, led by John Russell, Hilliards, met with Samuel L. Devine (R., Ohio) to point out that "government audits showed Ohio grain elevators were barely breaking even or even losing money on government storage."

George H. Moorhead, Leipsic, president of the Ohio Grain and Feed Assn., said U.S. Department of Agriculture audits conducted in six Ohio plants showed the average cost of storage was 17.2¢ bu. per year, although government payments provide only one-twentieth of a cent per day.

George G. Greenleaf, Worthington, secretary of the association, pointed out further that the 17.2¢ cost did not include such factors as shrinkage, quality deterioration, interest on investment or any profit for the operator.

"A lot of people are losing money in Ohio on government storage," Mr. Greenleaf said. "Further, the kind of wheat raised in Ohio—soft red winter wheat—is in demand and is not the type of wheat that accounts for the federal surplus. Ohio wheat is invariably sold within a year. The villain behind this whole thing is the farm support program."

Others in the delegation which called on Mr. Devine were Hugh Brubaker, New Carlisle; Earl Davidson, West Liberty; Frank C. Miller, Milford Center, and Byron M. Shepard, Christiansburg.

A similar group was contacting other Ohio congressmen "to present the true picture," Mr. Russell said, "so Ohio congressmen could act intelligently on the grain storage program."

Purina Announces Quarterly Earnings

ST. LOUIS — A drop in net sales and net earnings for the three months ended Dec. 31, 1959, has been reported by Ralston Purina Co. Compared with the same period in 1958, net sales dropped from $129,999,696 to $127,638,748 and net earnings dropped from $4,851,482 to $4,495,136.

Donald Danforth, chairman of the board, said that earnings for the three months ended Dec. 31, 1959, were 69¢ a share, compared with 75¢ for the same period a year earlier. "However, our earnings did show improvement over the 44¢ a share for the previous quarter," he said.

Mr. Danforth said, "last year, during the first six months, profits were 42¢ a share greater than during the last six months. It is the opinion of the management that the agricultural economy is gradually improving and being put on a firmer footing. If this is true, we see no reason to anticipate that there should be this fall-off in profits during the last half of the current fiscal year."

The board of directors declared the regular quarterly dividend of 30¢ a share payable on March 11, 1960, to shareholders of record at the close of business on Feb. 19, 1960.

ROBERT E. HUNT DIES

WAVELAND, IND. — Robert E. Hunt, 39, owner and operator of a feed and grain store here, died at his home. He had been in failing health for two years.

Judson Bemis to Head Bemis Bag

ST. LOUIS—F. G. Bemis, Boston, was elected chairman of the board and Judson Bemis, Minneapolis, president and chief executive officer of the Bemis Bro. Bag Co., it was announced this week by the company's board of directors.

Judson Bemis

The board also announced that C. W. Akin, Minneapolis, had been elected executive vice president, R. V. Scott, St. Louis, and B. L. Willmore, Boston, vice presidents, and J. T. Braxtan, St. Louis, assistant secretary.

Judson Bemis succeeds his brother, F. G. Bemis, who joined the company in 1926 and just completed his 20th year as its president. F. G. Bemis was elected a director of the company in 1927, assistant treasurer in 1929, vice president in 1937 and president in 1940. As chairman of the board, F. G. Bemis will be in the company's general offices in Boston.

The new president joined the company in 1937, following his graduation from Harvard University. Judson Bemis became manager of the Minneapolis plant in 1945 and was appointed director of central operations in 1952. He was elected a director of the company in 1939, assistant secretary in 1941, vice president in 1946, and executive vice president in 1956.

As president and chief executive officer, Judson Bemis will direct the company's nationwide operations from the Bemis general offices in Minneapolis.

Delmarva Broiler Prices Hold Steady

SALISBURY, MD.—Broiler prices in Delmarva held about steady last week in spite of 14% more birds going to market than the previous week.

The average price paid on the farm was 18.23¢ lb. The week before the price was 18.98¢. Delmarva broiler growers sent a total of 3,032 000 birds to market last week. Although the figure was 14% above the previous week, it was 6% below the corresponding week of 1959.

Chick Starts

Delmarva producers started 4,182,000 chicks during the week. This was 2% below the previous week but 11% above the corresponding week of last year. The number started was up 5% in Delaware, while the number started in Maryland was up 19% as compared with the same week a year ago. Settings in Delmarva were 2% above the previous week and 13% above the comparable week last year.

22-State Report

Nationwide, for 22 reporting states, hatcherymen set 47,176,000 eggs during the week ending Feb. 6. This was 1% below the previous week but 1% above the corresponding week a year ago. Settings were down from the previous week in 13 of the 22 reporting states. Decreases were reported in Alabama, Maine and Mississippi, accounting for 80% of the decline from previous week.

Broiler growers in the 22 states started a total of 34,089,000 broilers. This was 3% above the previous week and 7% above the corresponding week a year ago. Increases were reported for 17 states compared with the previous week. Largest increases occurred in Alabama, Texas, California, Pennsylvania and Missouri.

Wayne Stepp Named Foxbilt Sales Manager

DES MOINES, IOWA — Wayne Stepp has been promoted to sales manager of the feed division of Foxbilt, Inc., Des Moines.

Wayne Stepp

J. K. Lepley, vice president and director of sales, indicated the move was made in conjunction with a planned expansion program starting in 1960.

Mr. Stepp has been with the firm for six years. Since 1958 he has been the regional manager serving Kansas, Missouri, Nebraska and southwest Iowa. He is a graduate of Iowa State University.

Utah Feed Group Elects President

LOGAN, UTAH—Ray Hermansen, Gunnison, was elected president of the Utah Feed Manufacturers & Dealers Assn. at its annual convention here Feb. 4-5, to succeed Merrill Rushforth, Centerville.

Lawrence Zaugg, Ogden, took over as vice president from Ralph Blackham, Moroni, and Lawrence Morris, Provo, was relected secretary-treasurer, and J. O. Anderson, Logan, was reelected assistant.

New members of the board of directors are Robert Morris, Ogden, and Howard Allen, Salt Lake City. Other board members are Alan Bader and Wayne Farrell, Ogden; Stuart Richards, Trenton, and the officers.

Favorable reports were heard on efforts to obtain reduced rail rates on protein supplement feeds imported from other states and shipped in.

Dr. M. E. Ensminger, chairman of the State College of Washington department of animal science, discussed automation, and Dr. J. Clark Ballard, assistant extension director, Utah State University, emphasized the increasing importance of automation in the livestock industry.

Carl F. Neumann, secretary-general manager, National Livestock and Meat Board of Chicago, stressed the role of the board in education of the consuming public on nutritive value of meat, proper cooking and care of meats. Dr. Owen Thompson, Dr. Salsbury's Laboratories, Charles City, Iowa, discussed feed dealer-veterinarian relations, and Dr. John Quisenberry, head of Department of poultry science at Texas A&M College, talked about poultry feeding.

California Restricts Oregon Cattle Imports

SACRAMENTO—William E. Warne, state director of agriculture, has announced that California has amended its cattle scabies regulation to include restriction against the importation of cattle from Oregon.

At the request of the department, Edmund Brown, governor, has amended the regulation to require all cattle entering California from Oregon to be shipped by special permit from the State Bureau of Livestock Disease Control.

INTENTIONS

(Continued from page 1)

some differences between farmers' egg-type chick buying intentions as of Feb. 1 and their actual purchases are to be expected depending on egg and feed price relationships and other developments during the remainder of the hatching season.

Producers, according to Feb. 1 estimates, plan to purchase 27% of their chicks straight run, 66% pullet chicks and 7% cockerels. Last year they bought 25% straight run chicks, 68% pullet chicks and 7% cockerels.

Egg Price Slump Noted

The average price received by producers for eggs in mid-January was considerably below month-earlier and year-earlier prices. USDA reported that this year's mid-January price was 29.6¢ doz., compared with 30.7¢ at mid-December and 36.6¢ in mid-January of 1959.

The mid-January price was the lowest for the date since January, 1941.

Egg Supplies Ample

Egg supplies were ample to more than ample on large sizes. Best demand during the month was for the smaller sizes. USDA reported there was increased activity on the part of egg breakers during the latter part of January.

Farm flocks produced 5,344 million eggs during January—1% less than in January, 1959. Compared with last year, egg production was down 5% in the west north central states, 4% in the north Atlantic and 1% in the east north central. Egg production was above last year by 11% in the south Atlantic, 3% in the West and 1% in the south central states.

Production Rate

The rate of egg production in January was 17 eggs per layer, compared with the January, 1959 rate of 16.6 and the January average of 14.8. All regions showed an increase in rate except the West, where it was down 1% from a year earlier. Increases were 5% in the south Atlantic, 4% in the east north central, 3% in the north Atlantic, and 2% in the west north central and the south central states.

The nation's laying flock averaged 314,819,000 layers during January, compared with 324,331,000 layers during January, 1959—a decrease of 3%. Decreases from last year of 7% in the north Atlantic, 6% in the west north central, 5% in the east north central and 1% in the south central states more than offset the increases of 5% in the south Atlantic and 4% in the West.

February Rate

The Feb. 1 rate of lay was 55.3 eggs per 100 layers, compared with 54.7 eggs Feb. 1, 1959. The rate was above last year in all regions except in the west north central and the West. Increases were 4% in the south Atlantic, 3% in the north Atlantic and east north central and 1% in the south central. The rate of lay was about the same as last year in the west north central states, but down 3% in the West.

Hens and Pullets of Laying Age and Eggs Laid Per 100 Layers on Farms February 1

Year	North Atlantic	E. North Central	W. North Central	South Atlantic	South Central	Western	United States
Hens and Pullets of Laying Age on Farms (thousands)							
1949-58 (average)	56,818	67,606	96,526	33,249	53,728	37,028	344,954
1959	53,130	60,045	87,428	35,402	46,202	38,285	321,292
1960	49,346	57,969	81,596	37,004	45,603	39,973	311,491
Eggs Laid Per 100 Layers on Farms							
1949-58 (average)	53.5	52.1	51.3	46.2	40.3	52.6	49.8
1959	55.7	56.5	57.5	51.8	44.5	59.5	54.7
1960	57.2	58.2	57.4	53.7	44.9	57.8	55.3
Hens and Pullets of Laying Age on Farms (thousands)							
Dec. 1, 1959*	51,319	59,201	83,792	37,317	45,988	39,866	317,483
Jan. 1, 1960*	50,969	59,224	83,275	37,716	44,934	40,034	316,152
Feb. 1, 1960	49,346	57,969	81,596	37,004	45,603	39,973	311,491

*Revised. Revisions for other months in 1959 will be included in a report entitled Monthly Egg Production to be released later.

Estimated Industry Production for the Past 10 Years

Year	Million tons	% Change from 1949
		%
1950	29.1	+ 2
1951	32.8	+15
1952	34.4	+21
1953	33.7	+18
1954	35.0	+23
1955	33.6	+18
1956	35.7	+25
1957	36.0	+26
1958	40.0	+40
1959	40.0	+40

FEED TOTAL

(Continued from page 1)

Record production occurred in beef and sheep and swine feed manufactured. Beef and sheep were up 21% from 1958 and accounted for 8% of the total. Swine feed increased 4% last year and represented 15% of all feed manufactured. However, during the last quarter of 1959, swine tonnage was far below 1958 and December figures were 26% lower than the year before.

The tonnage of each of the three poultry feeds was less in 1959 than in 1958, with broiler feed down 6%, turkey down 5% and other poultry down 1%. In each case, tonnage near the end of the year was farther below 1958 levels than the average for the year. Dairy tonnage was stable throughout the year with little change from 1958 production.

Poultry feed, other than broiler and turkey, accounted for 33% of total tonnage reported to AFMA last year followed by broiler (19%), dairy (17%), swine (15%), beef and sheep (8%) and turkey (5%). The remainder was miscellaneous. The three poultry classes accounted for about 57% of the total (56% if computed from unrounded data).

The most pronounced trend in the production of the various classes of feed is the decrease in poultry feed other than broiler and turkey, AFMA noted. This class has decreased each of the last five years from 39% of all feed in 1954 to 33% last year. The major reason probably is, AFMA said, the declining consumer demand for eggs. Egg consumption per person has been lower than the preceding year in eight of the last 11 years since 1948. Retail egg prices have been lower than a year earlier in seven of the 11 years, so expenditures per person for eggs have declined substantially.

PILLSBURY

(Continued from page 1)

factor in the feed industry," said Mr. McNeal. "We have definite plans for more aggressive growth and expansion. Mr. Peterson's experience and knowledge of this business will be of great value to us in advancing this program."

The feed division currently operates 11 plants and sales offices and two research facilities. A new plant is scheduled to be opened in Jasper, Ala., this spring.

Nopco Chemical Sales, Earnings Set Record

NEWARK, N.J.—New records for both sales and earnings, exceeding those of 1958, the previous high, by more than 25% have been reported by Nopco Chemical Co.

Consolidated net earnings for 1959 were $2,262,576, compared with $1,750,222 the previous year. Sales and other income totaled $37,255,925 in 1959, compared with $29,235,196 in 1958.

The consolidated net earnings for 1959 were equivalent, after preferred dividends, to $2.17 per share on 1,026,551 shares, the average number outstanding during 1959. Earnings for 1958 were $1.71 per share on the average number outstanding that year, adjusted for the two-for-one stock split and stock dividends.

100,000 REASONS SOLULAC IS ALWAYS YOUR MOST ECONOMICAL SOURCE OF UNIDENTIFIED GROWTH FACTORS

...is produced in volume 12 months a year to keep your costs down

That's one reason SOLULAC is your most economical and most dependable source of unidentified growth factors. Here's another . . . leading nutritionists have proven that feedlot performance suffers when unidentified growth factors are left out of feed.* And, in these days, feed sales are made on a history of good feedlot performance. It's the wise feed manufacturer who keeps his feed performance record good . . . and keeps his costs down . . . by keeping SOLULAC in his feed formulas. SOLULAC, a fermentation product from corn, is guaranteed to be *free flowing* in 50 and 100 lb. bags, or bulk carloads. And it's always available, 12 months a year!

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Contract Raising Of Dairy Heifers Expected to Grow

TIFTON, GA. — The practice of dairymen selling their calves to a feeder for growing and then buying them back for milking is expected to increase in use, according to one of several talks presented at the Dairy Production Short Course held here at Abraham Baldwin Agricultural College.

Dr. E. R. Donoho, extension dairyman, Ohio State University, said dairy heifer contracting is in its second year of operation in Ohio.

Dr. Donoho explained that the growers of the dairy heifers are mostly farmers who do not wish to go into a large-scale dairy investment, but are able to grow out a limited number of heifers. Some of the growers are semi-retired persons or part-time farmers. They get the calves at different ages, ranging from birth to several months old, according to the individual contract.

Dr. Donoho said he had seen no two contracts alike. He read from a pattern contract, but noted that dairymen and growers usually find something they want to change. Most contracts state what expenses the dairy owner and the grower of calves are to share, and also contain agreements concerning calves that turn out to be unfit for milking.

Dr. Donoho stressed the importance of having a written agreement between people who go into the heifer contracting business.

Importance of Concentrates

Discussing "New Concepts in Feeding Dairy Cattle," Dr. John Donker, professor of dairy husbandry, University of Minnesota, declared that the successful dairying program must include large quantities of quality hays, but noted that grains and concentrates must be used also. He pointed out that 75% of the dairy cow's nutrients come from roughages, and 25% from concentrates.

Dr. Donker explained the forage testing procedure which was started by Pennsylvania State University and which is being used to some extent in other states.

The specialist showed slides of a complete hay baling operation. One machine shown pre-chews the green forage (in this case it was alfalfa), which is allowed to partly dry. Then the material is drawn into a machine which moves across the field, and presses the hay into blocks about 1 ft. square, and weighing 10-12 lb. (about the amount required by a cow for a meal).

He explained that the blocks of hay are dropped in the field and placed manually into a truck (the aim is later to have the bales placed in the truck mechanically). From the truck the bales are pulled up by a belt and dropped into a drying structure, out of which they are later carried by another belt into a truck to be carried to storage.

The Cow Pool

The cow pool type of operation was described by Dr. W. J. Slomaker, dairy specialist, feed division, Ohio Farm Bureau Cooperative Assn., Columbus, Ohio.

"The cow pool is hastening the trend toward larger dairy developments," Dr. Slomaker said.

He said a cow pool—operating on a large scale and consisting of several hundred cows—must keep records of performances of cows, must have means of identifying individual cattle, supply adequate loafing space and feeding facilities, provide for adequate care in all kinds of weather, have adequate waste disposal, have proper water disposal, watch out for mastitis and give antibiotics.

ATTEND SALES MEETING—These men attended the annual sales meeting of Whitmoyer Laboratories, Inc., at Myerstown, Pa. (left to right):

Front row, Glenn Trout, Myerstown; Ray Henry, Myerstown; Jack Richards, Gainesville, Ga.; M. B. Gardner, G & M Sales Co., Statesville, N.C.; Henry Suppan, sales manager, Myerstown; C. W. Whitmoyer, president, Myerstown; George Cook, Maxwell, Iowa; Thomas Balkcom, vice president, Myerstown; Harold Kauffman, Lebanon, Pa., and John Wandell, Myerstown.

Middle row, Irvin Henry, Myerstown; Sid Sands, Great Valley, N.Y.; Richard Winters, New Oxford, Pa.; Winston Brown, Grandone, Inc., New Gloucester, Maine; Ronald Myers, Harrisonburg, Va.; Al Lithgow, Port Credit, Ontario; Fred Dickens, Grandone, Inc., Norwood, Mass.; Cecil Stanfield, Boaz, Ala.; Hans Sorgenfrei, Mt. Victory, Ohio; Lloyd Wolfe, Elkhorn, Wis.; Leon Kauffman, Myerstown; William Rishel, Palmyra, Pa.; Kurt Schatzmann, Frey & Co., Flawil, Switzerland; Jay Gibney, Lebanon, Pa.; Stan Dickey, Port Credit, Ontario, and Roger Urich, Myerstown.

Back row, Francis Dobbins, Gainesville, Ga.; J. R. Wiley, Myerstown; John Gow, Port Credit, Ontario; Harold Corning, Yarmouth, Nova Scotia; John Stevens, Chalfont, Pa.; James Hardy, Dothan, Ala.; Kermit Wilson, Indiana, Pa.; Glenn Rohr, Doylestown, Pa.; Paul Snider, Kokomo, Ind.; Ted Rouse, London, Ontario; A. M. Brubaker, Myerstown; Tom Scanlan, Lebanon, Pa., and Harold Mulder, Holland, Mich.

Wants More Jobs Put Under Civil Service

DES MOINES, IOWA — Isadore Levin, state chemist, who has resigned from his state job to go into private business, told a grain dealers convention here what he thinks about the legislature's failure to put his and other similar state jobs under civil service.

He said, "No one can go out and hire technical help for jobs like these for the money we're paying. I've been state chemist by the grace of 9,000 votes—that's what my boss won one of his elections by.

"This job is a political job. The legislature said, 'You be a politician, go out electioneering for your job.' I don't see why these jobs have to be political patronage. They're too important. Somebody ought to rub some sense into the legislators' heads."

Mr. Levin, who has been employed by the state intermittently since 1939, will be a private consultant to the feed industry on legislative and labeling matters.

Named Vice President

TORONTO — George W. Stepan has been appointed a vice president of Toronto Elevators Ltd., according to John D. Leitch, president. Mr. Stepan will continue as manager of the vegetable oil division of the firm.

BACK SAVER WITH STEEL TRUCK BODY

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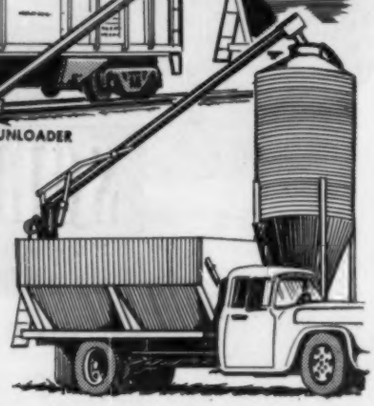

SKOOP SKIPPER

PAMCO delivers the most for your money. Dependable, precision engineered equipment reduces maintenance costs giving you more time to increase your bulk sales. PAMCO is a "sales clincher." You land more new accounts, service regular customers better and reduce headaches.

PAMCO handles many bulk materials — ground corn cobs, screened wood shavings, stoker coal, sawdust, fertilizer, expanded aggregate clay, screened bulk limestone and bulk cement.

BACK SAVER
- Stabilize to any grain body and Pamco's steel body.
- Exclusive unloading and loading.
- Pellets handled with minimum breakage.
- Smooth hydraulic operation.

SKOOP SKIPPER
- Tank stabilization.
- Standard 2, 3, or 4 compartment units.
- Positive seal assures against leakage of materials.
- Dispersing auger for loading leads into each compartment.
- Double gate per compartment standard for each unit.

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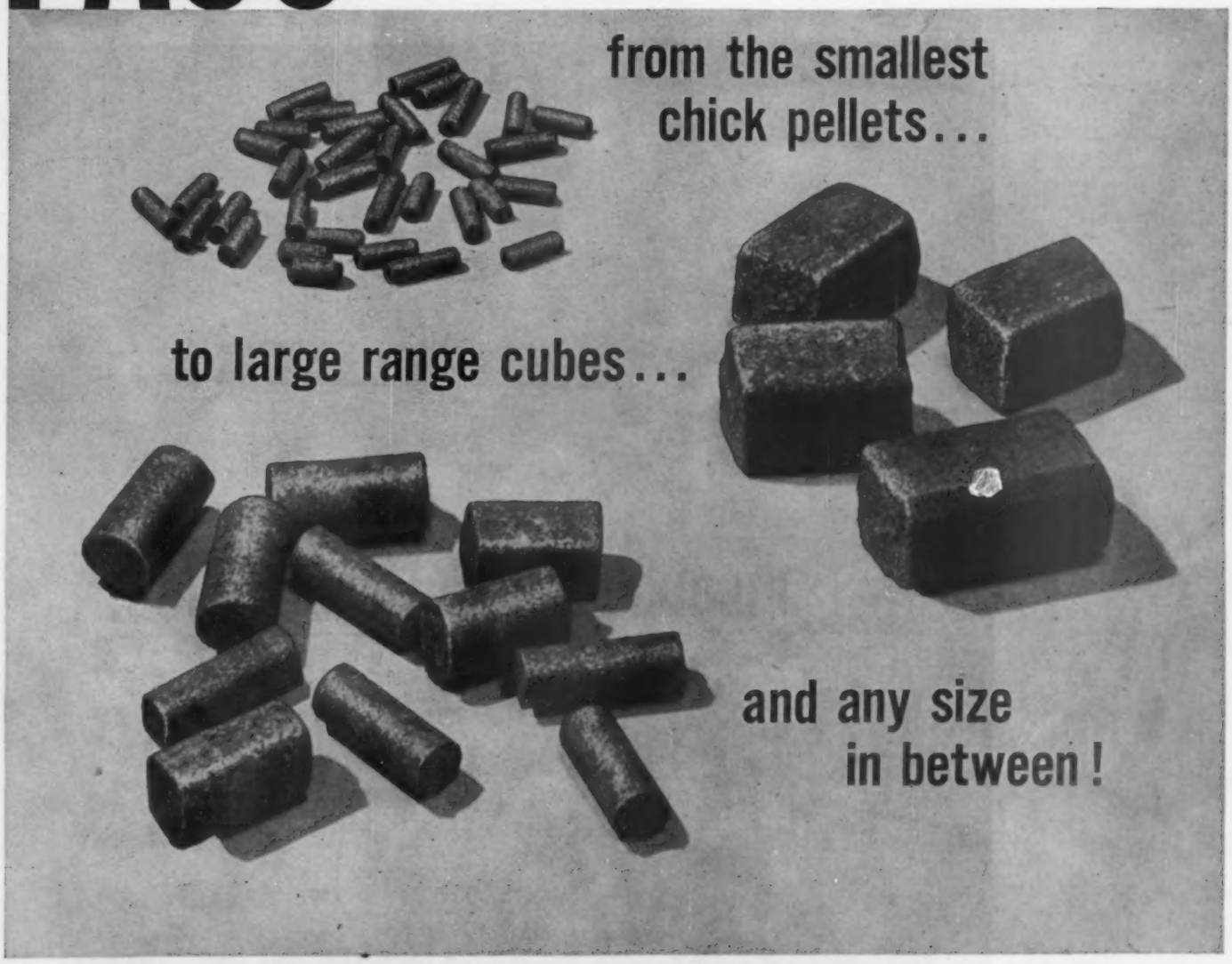

Pellets made with Paco mean repeat business, because Paco-ized pellets are entirely different from any other pellet.

Paco is a feed ingredient in itself, supplies plenty of essential nutrients for greater feed conversion and productivity. Its rich, molasses flavor adds palatability to all types of pelletized feed.

"Fines" are a thing of the past with Paco, because pellets form better and hold their shape until they are fed! That means less waste that normally increases feeding costs. Paco-ized pellets are glossy, slick in appearance, hold down choking dust in cattle feeds.

You can use Paco with confidence. Once customers see, smell and experience the goodness of Paco-ized pellets, once they watch meat, milk or egg production go up—you're in for additional business.

Get Paco, packed in convenient-to-use 50-lb. bags. Write us for information on pelleting and farm uses of Paco.

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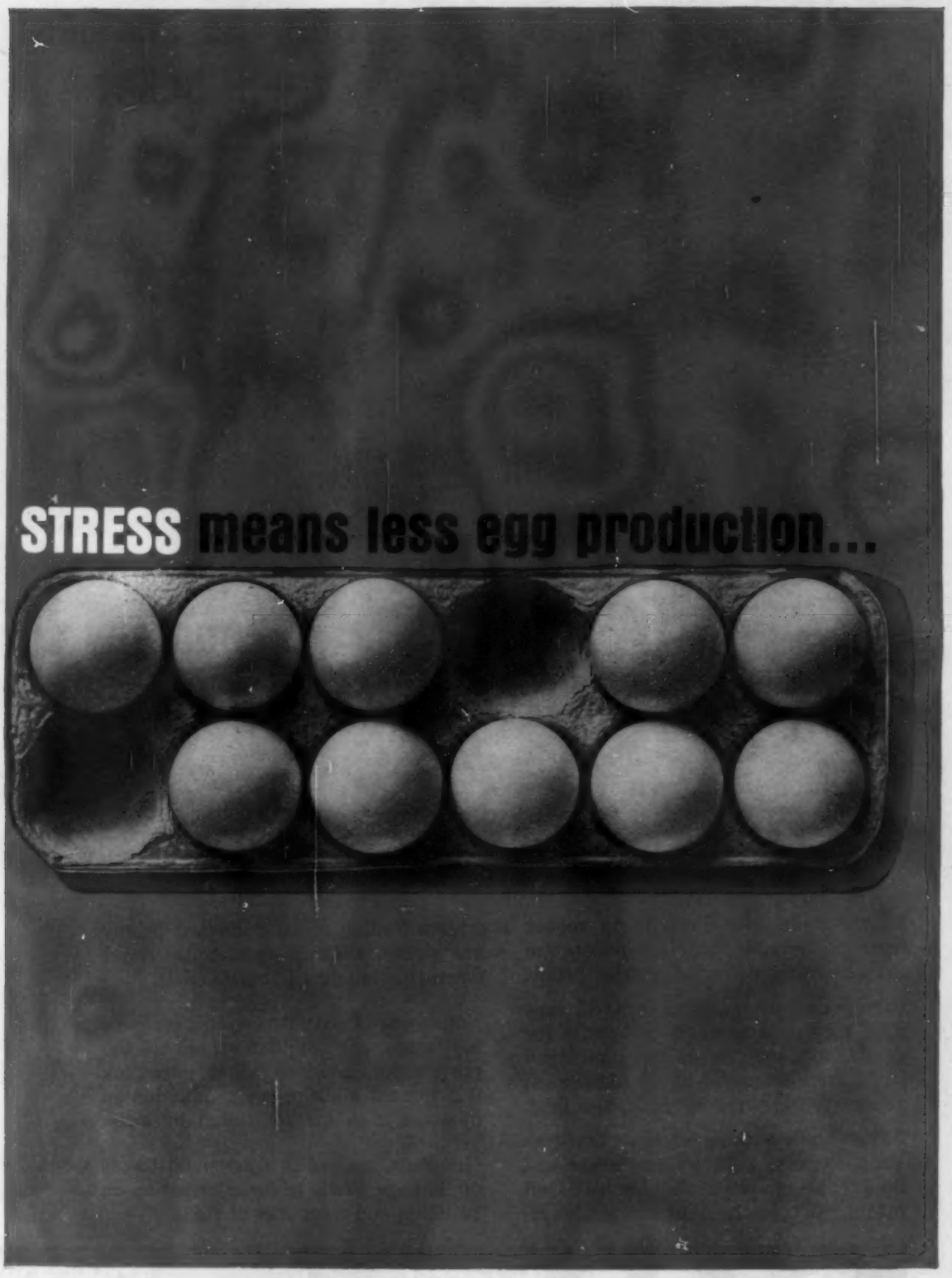
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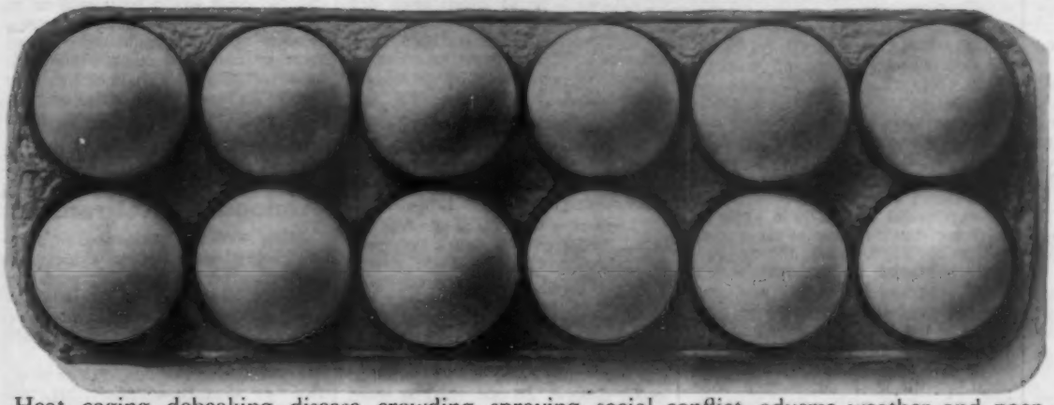

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CIBA

Costs of Retail Feed Credit Analyzed in Minnesota

By R. J. Herder and Dr. R. P. Dahl
University of Minnesota

Feed purchases represent the largest single production supply expense of Minnesota farmers. In 1954, for example, farmers in the state purchased $154 million of feed. This includes purchases from other farmers as well as from feed merchants.

Since farmers make heavy cash outlays for feed long before income is received they often need credit to finance its purchase. Dealers and manufacturers frequently sell feed to farmers on a credit basis.

A recent study of the credit practices of 144 retail feed dealers in Minnesota showed that most dealers, 44%, granted credit on open book accounts only.

About 40% of the dealers reported that credit was granted for 90 days; nearly 20% of the dealers granted credit for 30 days, while the remainder gave credit for 6 months or longer or had no specific time limit.

About 6 out of every 10 feed dealers made no separate charges for credit. The others made charges after a specific length of time. The most common interest rate was 6%. Dealers indicated that the farmers often shop for liberal credit terms, hence it was difficult to establish credit charges without losing customers. Often the dealer is the last to receive payment because the credit is unsecured. This results in a large amount of dealers' capital getting tied up in accounts receivable.

The dealers cited several reasons for offering credit to their customers. One factor that was frequently mentioned was meeting the credit terms of competitors. The retail feed business is highly competitive. The average dealer in this study had a trade area with a radius of about 15 miles. More than 80% of the dealers had five or more competitors in their area.

Other dealers contended that farmers could not get adequate credit from lending agencies and hence the dealer has to provide it.

Costs to Dealer

The credit costs of four dealers were studied in detail. Total sales of those firms ranged from $452,875 in firm A to $110,133 in firm D. Firm A had the largest ratio of credit sales to total sales, 70%, while this ratio was only 28% in firm B (See accompanying table).

Credit costs can be divided into two groups—direct and indirect. Direct costs are the most important for management to watch because these are costs that can be controlled.

EDITOR'S NOTE: The accompanying article is from Minnesota Farm Business Notes, a University of Minnesota Agricultural Extension publication. R. H. Herder and R. P. Dahl, University of Minnesota economists, report the results of a survey in Minnesota that shows granting credit is an "important type of non-price competition among feed dealers."

In fact, they could be eliminated if credit were also eliminated.

Interest on funds invested in accounts receivable is the largest direct cost (see accompanying table). Since this interest is not an out-of-pocket cost, it was estimated by applying a 6% rate to the year's average accounts receivable outstanding in each firm. Interest collected from credit charges was subtracted from this amount.

Bad debt expense is also an important direct credit cost. This was difficult to determine with accuracy because of the accounting procedures used by these firms. It was estimated to be .5% of the year's average accounts receivable.

If total direct credit costs are larger than the gross margin on credit sales, then the firm should drop its credit program if direct costs cannot be reduced. As shown in the table, the gross margin on credit sales less direct credit costs ranged from $37,215 to $2,708.

The second group of credit costs—the indirect costs—consists of managerial, clerical and mileage expense. A characteristic feature of these costs is that they often cannot be significantly reduced by eliminating the credit program. Managerial and clerical costs shown were based on estimates of the time personnel spent on credit work. Mileage was considered an indirect cost because travel in connection with credit was often done in conjunction with other business matters.

The gross margin on credit sales in firm D was not sufficient to cover both the direct and indirect credit costs. This firm was having credit problems as indicated by the fact that 43% of its total accounts receivable outstanding were more than one year old. It granted credit on a six month basis, but charged interest after 60 days. The manager indicated, however, that interest charges were often overlooked at the time of payment.

If a firm can reduce its credit costs through a more effective credit policy without losing sales, its profits can be increased. Some firms may find that a tightening of credit terms may reduce costs without an offsetting drop in profits due to lost volume. Others may find that more credit, under a well managed program, may increase volume enough to more than cover the extra costs. Conditions vary so much from one dealer to another that each must make this comparison for himself. A knowledge of the direct credit costs at a given level of sales is helpful in making such estimates.

Costs to Farmer

In general, the retail feed dealers felt that the costs of extending credit were absorbed by them rather than being passed on to farmers.

The farmer may share the costs of retail feed credit in two ways, however. First, direct charges in the form of interest can be made by the dealer. This cost to the farmer is not too important because, as pointed out earlier, most dealers do not charge for credit. Furthermore, the survey indicated that some dealers who do make charges do not enforce them rigorously.

A more important consideration may be the extent to which the farmer bears the cost of this credit in the form of a higher price for feed. Although it is difficult to offer conclusive answers to this question, a knowledge of the characteristics of the feed industry may give some indications.

The retail feed industry is characterized by a large number of firms. It is relatively easy to enter the industry, and firms can operate with or without a franchise from a major feed manufacturer. Businesses dealing in farm supplies can also add a feed line with a small capital investment. Furthermore, the possibility of substitution between different kinds and brands is quite high. Hence, the price of feed may not vary appreciably from dealer to dealer.

The individual dealer, however, may attempt to increase sales by various forms of nonprice competition. Brand promotion through advertising is one means of building sales.

Providing extra or better services is another form of nonprice competition. Credit is one of these services. The variations in credit terms and practices of the dealers in this study are an indication of the use of credit for this purpose.

The provision of credit increases dealers' costs which are probably absorbed by the firm in the short-run. The increased costs associated with credit will eventually result in operating losses for some firms, particularly those having a poorly managed credit program. Such firms go out of business eventually and prices will rise in the remainder to reflect the added credit costs. Hence, in the longer run the cost of credit will be included in the price paid by the farmer.

If, however, the credit were eliminated there is no guarantee that the reduced costs would be passed on to farmers in the form of lower prices. Dealers may substitute some other form of non-price competition such as advertising. The costs of this may be just as high to the dealer and yet have no direct value to the farmer.

Estimated Credit Costs, Four Retail Feed Dealers, Minnesota, June, 1957-May, 1958

	Firms			
	A	B	C	D
Total sales	452,875	365,109	327,213	110,133
Credit sales	317,013	103,675	167,504	64,875
Cost of credit sales	275,533	93,940	151,708	60,670
Gross margin	42,480	9,735	15,796	4,225
Direct credit costs:				
Supplies and postage	122	135	103	60
Collection	1,200	24	0	46
Interest	3,601	1,530	1,286	1,281
Bad debts	342	128	165	130
Total direct costs	5,265	1,817	1,554	1,517
Gross margin less direct costs	37,215	7,918	14,242	2,708
Indirect credit costs:				
Managerial	4,136	238	150	3,728
Clerical	1,014	344	327	1,060
Mileage	140	14	17	70
Total indirect costs	5,290	596	494	4,858
Gross margin less total credit costs	31,925	7,322	13,748	(2,150)

SALES REPRESENTATIVES—District sales representatives of A. T. Ferrell & Co. from the U.S. and Canada attended the 1960 Clipper sales meeting at the firm's headquarters in Saginaw, Mich. The training course covered all phases of the firm's manufacturing and sales program.

Shown here (left to right) are:
Back row—Dick Carr, sales manager, Saginaw; Paul Holzinger, president, Holzinger Co., Santa Fe Springs, Cal.; Owen Collins, Portland, Ore.; Jim Vosburgh, Boise, Idaho; John Langdon, Saginaw; Ed Krause, Saginaw, and Bob Cooper, Ogden, Utah.
Second row—Bill Harris, Montreal, Canada; Floyd Sovey, Saginaw; Ed Stauffer, Portland, Ore.; Ed Cecka, Buffalo, N.Y.; Laurence Boatz, Fargo, N.D.; Bob Birkman, Minneapolis, Minn.; Bill Wallace, Canton, Miss.; Fred Shuck, Kirksville, Mo.; Lew Sarr, Ashland, Ohio; Art Hagedorn, Kirksville, Mo.; Warren Light, Saginaw; Bob Fry, Saginaw; Duane Tyler, Danville, Ill.; Andy Anderson, Fremont, Neb., and Cig Segelstrom, Denver, Colo.
Third row—Lee Truhan, Saginaw; Ken McCormack, Denton, Texas; Ira Willis, Minneapolis, Minn.; Henry Callis, Raleigh, N.C.; Elden Kaylor, president, A. T. Ferrell & Co., Saginaw; Ron Banton, Indiana-Saginaw; Don Helms, San Gabriel, Cal.; Bud O'Neil, Spokane, Wash., and Ralph Walter, Saginaw.
Front row—Bob Nash, Montreal, Canada; Clarence Techentien, Saginaw; Jim Henderson, Saginaw; Gus Stricker, Saginaw; Mose Nowasad, Saginaw; Al Boyer, Saginaw; Bernie Turner, Nashville, Tenn., and Tom Shaw, Winnipeg, Canada.

Harold McCormick Announces Retirement

NEW YORK—Retirement of Harold S. McCormick, after 49 years in the fertilizer and feed business, has been announced by H. J. Baker & Bro., Inc. Mr. McCormick, however, will continue in a consultant capacity with the company.

Starting his career in 1911 as an office boy with H. J. Baker, Mr. McCormick was executive vice president of the company at the time of his retirement. During that period, he became well known in the fertilizer and feed business.

H. J. Baker & Bro., Inc., specializes in feed and fertilizer materials and heavy chemicals.

Joins Day Sales Co. Kansas City Office

KANSAS CITY—Appointment of D. A. Harrington to the Kansas City office of the Day Sales Co., Minneapolis, has been announced by Max R. Springer, president.

D. A. Harrington

Mr. Harrington has 10 years of sales and engineering experience in air handling equipment and related fields. For the past two years he has been a sales engineer for McNamara Sales Co., St. Paul, Minn. He previously served in the sales department of Manners-Motz Co., St. Paul, and as a mechanical engineer for Crane Co. of Minnesota.

He will report to F. Neil Leishman, district manager in charge of the Kansas City office.

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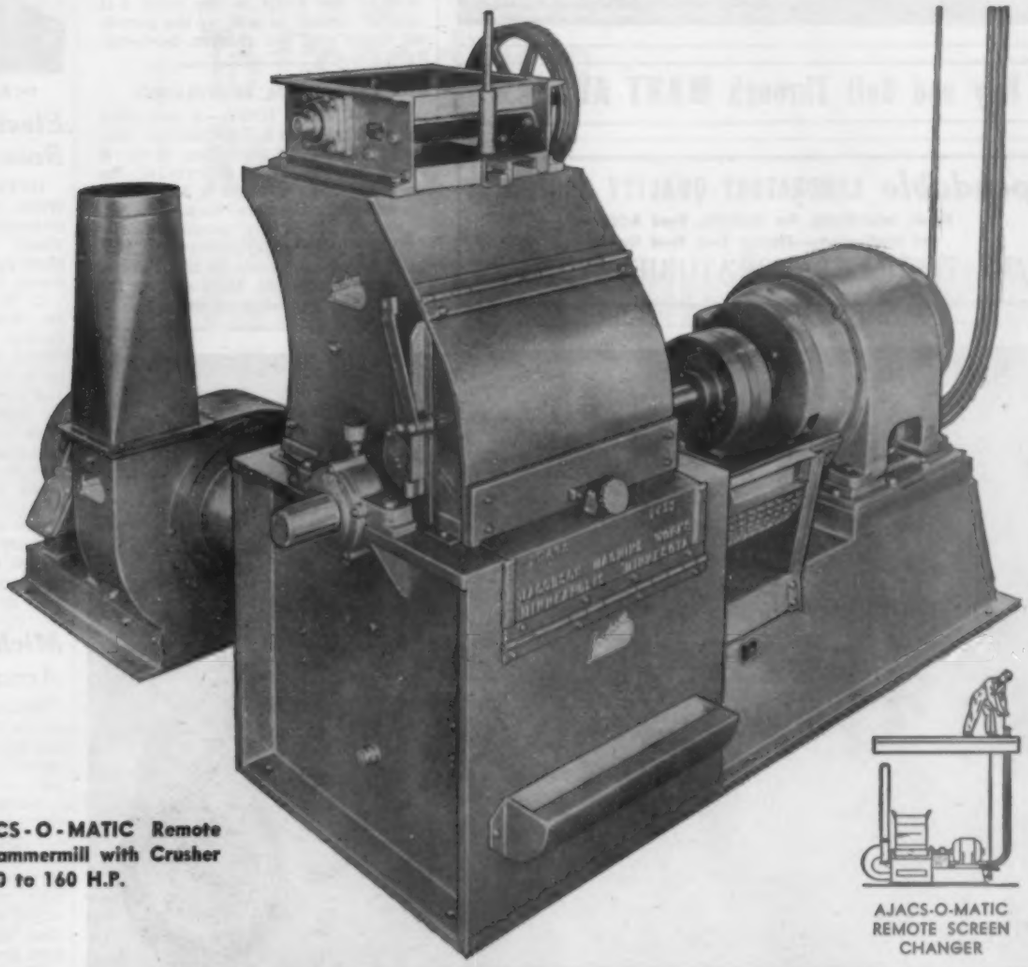
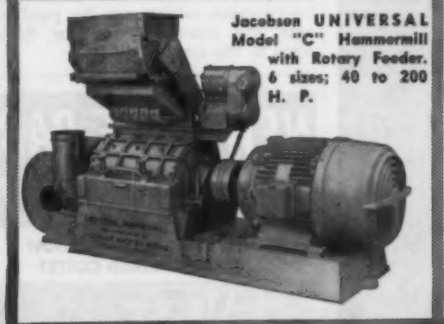
Hammermills

for every grinding need

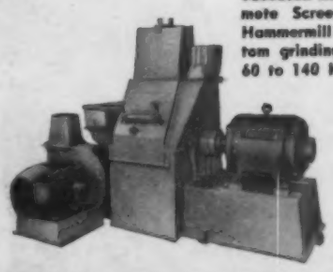


Jacobson AJACS-O-MATIC Remote Screen Change Hammermill with Crusher Feeder. 4 sizes; 50 to 160 H.P.

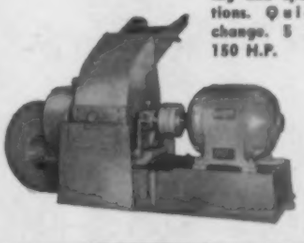
AJACS-O-MATIC REMOTE SCREEN CHANGER



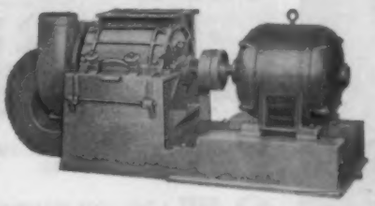
Jacobson UNIVERSAL Model "C" Hammermill with Rotary Feeder. 6 sizes; 40 to 200 H. P.



Jacobson MASTER Remote Screen Change Hammermill for custom grinding. 3 sizes; 60 to 140 H.P.



Jacobson AJACS Hammermill for custom grinding and special applications. Quick screen change. 5 sizes; 20 to 150 H.P.



Jacobson UNIVERSAL "Junior" Hammermill. 3 sizes; 10 to 50 H.P.

Jacobson AJACS Model "T" Hammermill. 4 sizes; 20 to 100 H.P.

Jacobson PULVERATOR for moderate grinding capacity or finishing dry products. 5 sizes; ¾ to 15 H.P.

Jacobson SPEEDY Grinder. 1 size; 5 to 15 H.P.

Write for Bulletins and Name of Representative

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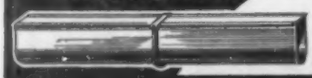
The Finest Money Can Buy!



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Dependable LABORATORY QUALITY CONTROL

Feeds, Ingredients, Fat Stability, Feed Additives and Medications—Protect Your Feed Quality

Pope TESTING LABORATORIES BOX 903 DALLAS, TEXAS

South Carolina Sets Poultry Festival Plans

BATESVILLE, S.C. — The 1960 South Carolina Poultry Festival will be held here May 11 with Clyde Rauch, Leesville, again serving as general chairman.

Highlight of the tentative program will be the finals in the state 4-H broiler contest as well as the parade of floats and the chicken barbecue.

FEED FIRM PURCHASED

IOWA CITY, IOWA—A new firm, Iowa City Grain & Feed Service, Inc., has taken over the Maas Grain & Feed Service here. Officers of the new concern are Virgil G. Mortensen, president and general manager; William K. Maas, vice preesident, and William H. Bartley, secretary. Mrs. Iva Maas will remain on the board of directors, with Mr. Maas serving the new firm in an advisory capacity.

Dr. J. R. Wiley Glenn A. Trout

Elected to Whitmoyer Board of Directors

MYERSTOWN, PA.—Dr. James R. Wiley, director of development and technical services, and Glenn A. Trout, plant superintendent, have been elected to Whitmoyer Laboratories, Inc., board of directors.

C. W. Whitmoyer, president, said Dr. Wiley is a graduate of the University of Pennsylvania veterinary school. Following graduation in 1941, he was engaged in general practice and worked part-time for Whitmoyer. In 1946 he began devoting all his time to the firm, and in 1955 was appointed director of development and technical services.

Mr. Trout has been with the company since his graduation from Albright College as a chemistry major in 1939. Prior to World War II, he served as a sales representative and also worked at the firm's production unit in Maine.

Michigan Emergency Area to Set Program

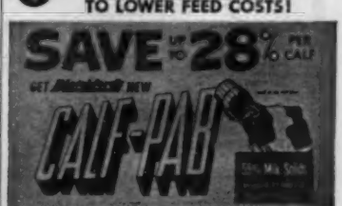
MARQUETTE, MICH.—Representatives from seven upper Michigan counties met with state and federal agricultural officials here Feb. 5 to plan an emergency feed program.

Baraga, Houghton and Ontonagon counties last week, were designated emergency feed grain districts, with farmers permitted to buy government surplus grain for cattle feed at support prices. Chippewa, Marquette, Alger and Dickinson counties asked that they be designated emergency feed grain districts.

The grain shortage in the Upper Peninsula counties was caused by heavy rains, which cut the yield of oats, the primary grain for dairy cows in the area.

NEW CALF-PAB SALES AIDS!

1 NEW DISPLAYS SHOW HOW TO LOWER FEED COSTS!



2 NEW SUSPENSION TEST SHOWS CALVES GET FULL NUTRITIVE VALUES!

3 NEW 1-DAY FREE FEEDING SAMPLE WINS NEW SALES!

WRITE TODAY! FOR SAMPLES AND NEW CALF-PAB SALES AIDS!

Blatchford's ESTABLISHED IN 1906

Lasting Immunity To Coccidiosis Requires EXPOSURE and CONTROL...

THIS "PROTECTION TEAM" ASSURES BOTH!

The mortality and morbidity that arise from coccidiosis outbreaks make LASTING immunity a must!

NOW... FOR THE FIRST TIME... with the "PROTECTION TEAM" of CocciVac* and a recommended coccidiostat, such as Trithiadol®, LASTING immunity is obtained for replacement flocks—top performance assured for broilers.

When CocciVac and Trithiadol are used as directed, chicks are given a mild exposure through vaccination and are protected while immunity is developing. Solid, active immunity is provided at savings of from $2.50 to $7.50 per thousand birds over the use of a coccidiostat alone.

The early immunity developed by this "PROTECTION TEAM" means lasting protection for replacement flocks—heavier chickens and better feed conversion for broiler growers.

Because you can afford nothing less than the best protection . . .

GET THE FULL STORY ON THE "PROTECTION TEAM"

See your Sterwin representative/or send coupon today!

*CocciVac is the registered trademark of Dorn and Mitchell Laboratories, Inc.

STERWIN CHEMICALS INC. FS-220
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1450 Broadway, New York 18, N. Y.

Please send me complete data on PROTECTION TEAM IMMUNITY against coccidiosis.

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determines moisture content of Feedstuffs in matter of minutes

NEW CENCO Moisture Balance

This new improved laboratory instrument by Cenco accurately measures moisture content of grains and feed components. Is simple to operate by the most inexperienced laboratory technician. Saves time and labor by drying and weighing test samples simultaneously. Moisture-loss can be read directly from calibrated scale after few short minutes. Results are repeatable.

Recommended for:

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Balance features built-in autotransformer which regulates voltage automatically, provides more convenient temperature control. Comes equipped with deep design disposable weighing dishes for liquid or solid samples. Write for details. *only* $295.00

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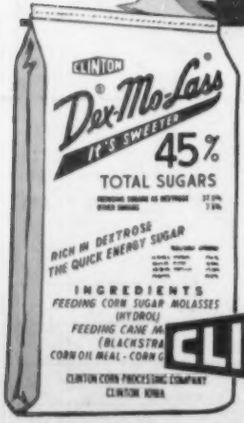
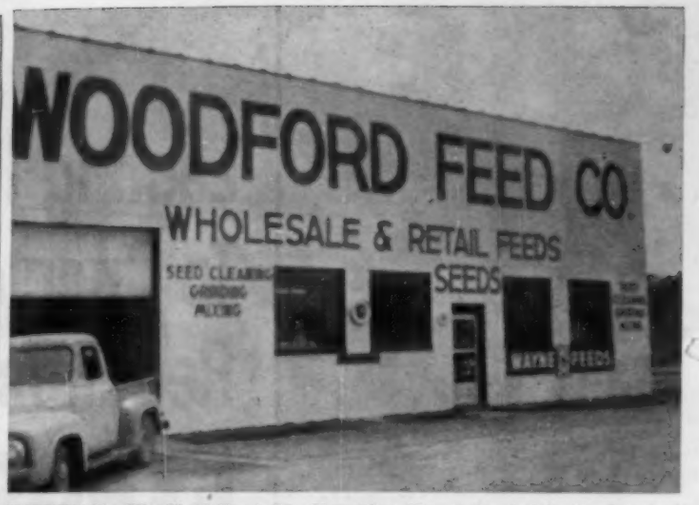
Livestock really "live-it-up" when you feed Dex-Mo-Lass It'S SWEETER



MOLASSES-RICH—made from highly nutritious ingredients: Feeding Corn Sugar Molasses (Hydrol), Feeding Cane Molasses (Blackstrap), Corn Oil Meal, and Corn Gluten Meal. **BONE-DRY**—flows freely in hottest or coldest weather. Packed in 50-lb. moisture-resistant bags. SUGAR-SWEET—makes any animal ration more palatable; steps up feed and water consumption for bigger gains. **DOUBLY-USEFUL**—highly nutritious in rations for all farm animals; scientifically formulated to preserve the quality of silage.

CLINTON CORN PROCESSING COMPANY
CLINTON, IOWA



EXTERIOR—Woodford Feed Co., Versailles, Ky., is located in the heart of the horse farm country of Kentucky.

Versatility of Operation Meets Needs of Kentucky Customers

By Al P. Nelson
Feedstuffs Special Writer

Versatility of operation to meet the diversified feed and related supply needs of customers is one of the reasons why Woodford Feed Co., Versailles, Ky., owned and operated by Robert Cleveland, is attaining an excellent volume of business.

Located in the heart of the horse farm country of Kentucky, Mr. Cleveland makes a great deal of horse feed under his own Big W brand. He points out that many horse farm owners have their own special formulas on horse feeds, and he makes a variety of these products for the trade. Some of these horse feeds may contain up to 25% molasses, depending upon the wishes of some customers.

In addition, Mr. Cleveland also makes Big W sheep feed, egg mash, starter and grower feeds. To back up this lineup of complete feeds, he also has grinding and mixing equipment. Thus, the farmer who has grain can work it into his program through the cooperation of the feed mill. On the other hand, if the farmer has a special formula he wishes made, and has no grain of his own, he can buy both grain and supplement from Woodford Feed Co.

"We specialize in working with our customers to give them the products and the service they want," states Mr. Cleveland. "Our general line of Big W feed takes care of many feeders' needs, but we do a lot of custom work, too."

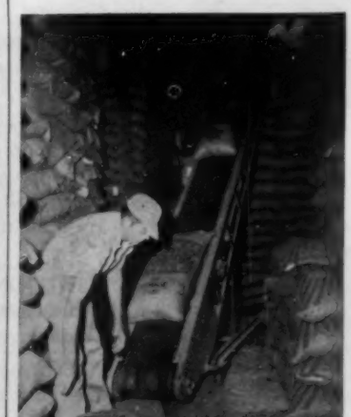
SACKING FEED—Shown is an employee sacking feed off one of two mixers.

Mr. Cleveland, a graduate of the University of Kentucky, is a close observer of the cattle, hog and poultry conditions in his area of Kentucky, which is one reason why farmers like to consult with him about their feeding problems.

For example, in this area of Kentucky there are many feeder cattle and feeder pigs raised. The cattle are fed for about 75 days on Kentucky grass, plus some grain, and then are shipped to northern feed lots. When such cattle begin to use about 10 lb. or more of grain per day, then sup-

(Turn to page 22)

OWNER — Robert Cleveland (left), owner and operator, shows a prospective customer a farm chemical product in the attractive farm store.



CONVEYOR—This conveyor is used to help pile sacked seed and feed in warehouse.

For information or a quotation on *Myvamix Vitamin E Feed Supplement*, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • Charles Albert Smith Limited, Montreal and Toronto • Or, contact the distributor nearest you.

Vitamin E is considered by many authorities to be an essential part of a nutritionally complete diet for chickens, turkeys, dogs, and other animals. We will be happy to send literature references on request.

The "d" means the vitamin E in *Myvamix Vitamin E Feed Supplement* is the same stereoisomer that appears in nature. 1 milligram of *d*-alpha-tocopheryl acetate is equivalent to 1.36 International Units of Vitamin E.

Myvamix®
VITAMIN E
FEED SUPPLEMENT
DPi
MADE IN ROCHESTER, N. Y., U. S. A. BY
DISTILLATION PRODUCTS INDUSTRIES • DIVISION OF EASTMAN KODAK COMPANY
CONTAINS distilled d-alpha-tocopheryl acetate concentrate absorbed on soy grits.
20,000 INTERNATIONAL UNITS OF VITAMIN E PER POUND

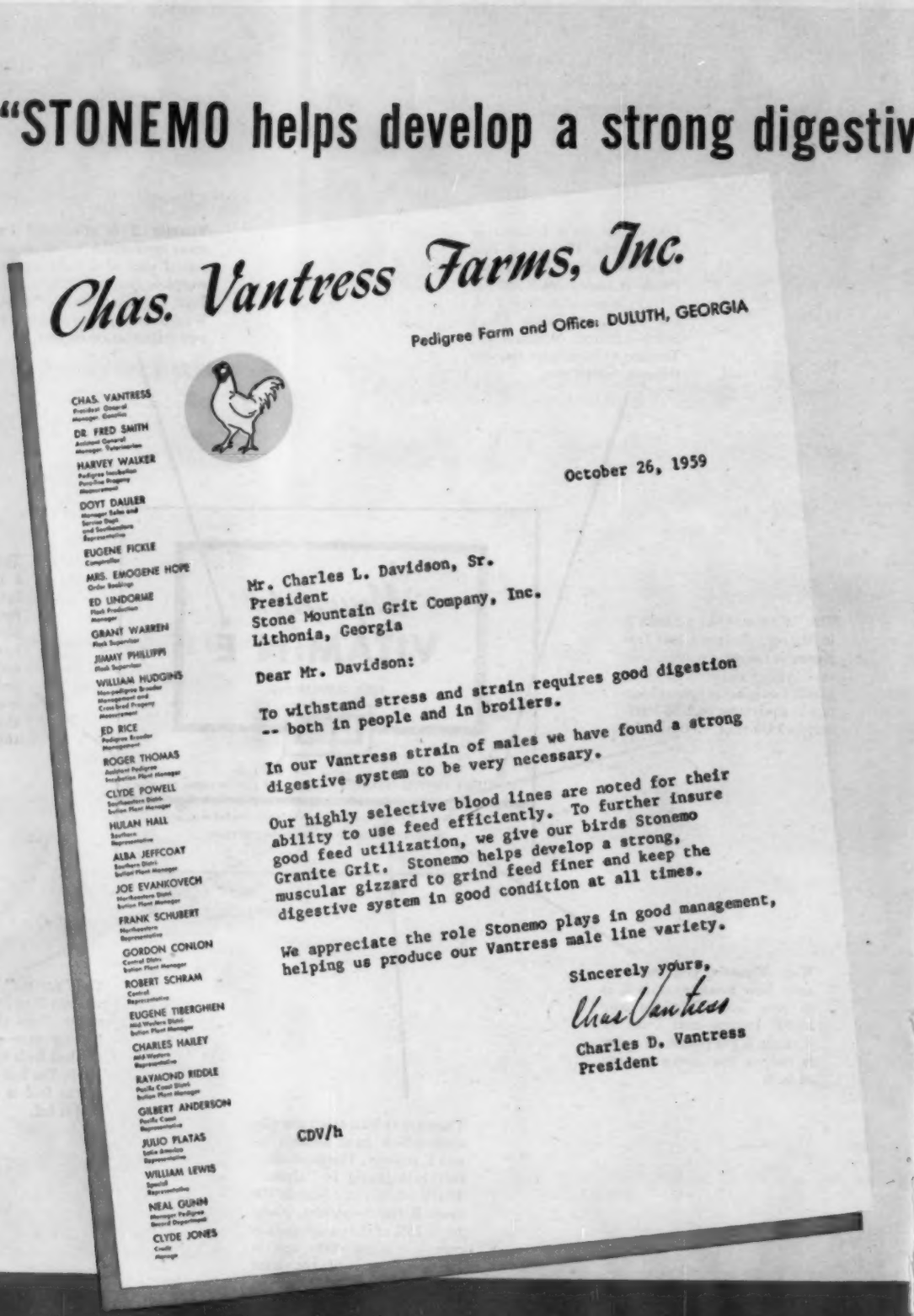
The vitamin E in *Myvamix* is on a dry, non-dusting soy grits base. We use grits instead of meal because they have less fiber, less moisture, more protein, more uniform particle size, and are dusted to remove hulls and powder. All this means a higher quality product, one that's as easy to handle as anything in your mill.

With *Myvamix*, you know exactly how much vitamin E is in your feed. There's a sure 20,000 International Units of Vitamin E per pound. The cost is only a few dimes per ton of feed.

There are at least seven tocopherols which have some vitamin E activity. The most effective biologically is "alpha." That's what is in *Myvamix Vitamin E Feed Supplement*. (Only 10 to 15% of the tocopherols in corn is "alpha"—the rest is "gamma," one of the least effective of all.)

The "acetate" means that the vitamin E in *Myvamix* is really stable. Tests show no loss of potency even after storage in finished feeds for six months at 100 F. The full potency you put in the feed is there when the feed is fed.

"STONEMO helps develop a strong digestive



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Pedigree Farm and Office: DULUTH, GEORGIA

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Assistant General Manager, Veterinarian
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DOYT DAULER
Manager Sales and Service Dept. and Southeastern Representative
EUGENE FICKLE
Comptroller
MRS. EMOGENE HOPE
Order Bookings
ED LINDORME
Plant Production Manager
GRANT WARREN
Plant Supervisor
JIMMY PHILLIPPI
Plant Supervisor
WILLIAM HUDGINS
Non-pedigree Breeder Management and Cross-bred Progeny Measurement
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GILBERT ANDERSON
Pacific Coast Representative
JULIO PLATAS
Latin American Representative
WILLIAM LEWIS
Special Representative
NEAL GUNN
Manager Pedigree Record Department
CLYDE JONES
Credit Manager

October 26, 1959

Mr. Charles L. Davidson, Sr.
President
Stone Mountain Grit Company, Inc.
Lithonia, Georgia

Dear Mr. Davidson:

To withstand stress and strain requires good digestion -- both in people and in broilers.

In our Vantress strain of males we have found a strong digestive system to be very necessary.

Our highly selective blood lines are noted for their ability to use feed efficiently. To further insure good feed utilization, we give our birds Stonemo Granite Grit. Stonemo helps develop a strong, muscular gizzard to grind feed finer and keep the digestive system in good condition at all times.

We appreciate the role Stonemo plays in good management, helping us produce our Vantress male line variety.

Sincerely yours,

Chas Vantress

Charles D. Vantress
President

CDV/h

STONEMO GRANITE GRIT

It's What's Inside the

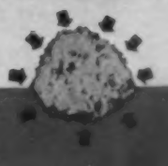
system to withstand stress and strain"

says
Charles Vantress

No product costs so little yet does so much to develop broilers with strong digestive systems as STONEMO GRANITE GRIT— Research *Proved*— Industry *Approved.*

Above—Mr. Charles Vantress inspects one of his precision bred Vantress males.

Above—Aerial view of the ultra-modern Charles Vantress Farms.



STONE MOUNTAIN GRIT COMPANY, INC. • Lithonia, Georgia

Gizzard that Counts

midwest alfalfa blenders, inc.
The Ranch Mart
95th and Mission Road
Prairie Village 15, Kansas
Mitchell 9-0386 (Kansas City)

MIDWEST GREEN BANNER DEHY

DEPENDABILITY... in Quality and Service

plement is generally added to the ration.

In wintering the cattle on hay, or hay and silage, plus about 2 lb. grain per head per day, they only gain ¾-1 lb. per day. If they gain more, the producer is more or less defeating the purpose of utilizing pastures in the spring and summer months.

Grass Resource

Kentucky cattle go to the lots from 600 to 1,100 lb. Mr. Cleveland points out that Kentucky has grass to sell, just as the north has corn to sell. Therefore any cattle feeding program in Kentucky makes intensive use of this natural resource, plus some grain and supplement, to the economic welfare of the raiser.

"We key our feed selling and service program to the grass situation," says Mr. Cleveland, "and try to help the cattle feeder get the most he can from Kentucky grass."

Farmers in this part of Kentucky are also raising more feeder pigs every year, Mr. Cleveland reports. "They are raised to weights of 60 to 100 lb. and are then shipped north for fattening. Lexington has developed quite a sizable feeder pig market, sometimes having as many as 2,000-3,000."

In addition to adjusting his feed manufacturing and custom mill operations to the special requirements of Kentucky feeders, especially due to the abundance of Kentucky grass, Mr. Cleveland makes an effort to cater to both the large feeder and the man who buys in smaller quantities. The average amount of feed sold at a time to a customer is one half ton or less, he states. One third of the feed business is cash.

Cash and Carry

He allows a cash and carry discount of 15¢ on cwt. lots, and 25¢ cwt. on ton lots. He does not encourage the delivery of feeds because of high costs. Many of his customers have gotten into the habit of hauling their own feeds.

Equipment in the feed mill includes a Jay Bee 50 h.p. mill, a 1-ton Prater mixer, a 2-ton Fords mixer, a Fords molasses blender and a 20-ton Howe scale. There is a 4,000 gal. molasses storage tank outside the building with gravity feed.

The grinding and mixing rate is 20¢ cwt., and molasses sells for approximately 3¢ lb.

"We also use molasses in sheep feed," reports Mr. Cleveland. "Quite a few farmers raise lambs here to weights of 85-90 lb. and sell them in May through July."

Mr. Cleveland's versatility is further shown in his large and profitable seed department. Here he has a Howe seed cleaner and a Carter disc separator. His men clean a great deal of Kentucky Fescue Grass 31, also orchard grass and small grains. Charges for fescue grass cleaning are 1½¢ lb., orchard grass 2½¢ lb. and small grains 25¢ cwt. Mr. Cleveland also buys and ships a great deal of grain. Some is sold at retail in this area.

"The seed volume helps to build business at a time when feed volume is down," says Mr. Cleveland. "They are excellent companion departments for us. We offer free inoculation of seed if the farmer buys materials from us."

He sells quite a bit of vetch which is used with small grains as a crop cover in this area.

Mr. Cleveland does some field work himself. He also sells Wayne feeds and does resale work with a Wayne representative. He also cooperates with the county agent in holding and publicizing swine, tobacco and cattle meetings as well as pasture improvement and veterinary gatherings. In this work he says he meets many people closely identified with agriculture, and he learns a great deal from them.

Competitor's Customers

It is characteristic of a man like Mr. Cleveland to help competitor's customers when they ask him. "If for some reason the farmer comes to us and asks us how to use a competitor's product we tell him what we know about it," says Mr. Cleveland. "It is not good business to give help only on the products you sell. You can build good will both ways."

Mr. Cleveland credits his success in the feed and seed business to hard work, service and the handling of quality products. He says the dealer who hopes to win friends and customers needs to be honest with his customers. He also needs to train his personnel in his policies.

This dealer also has some definite ideas about advertising. He likes postcard direct mail copy, and often sends 400-500 postcards to customers advertising various feeds or seasonal products. He does not believe in advertising price, as price alone will not sell a product. He says a dealer needs to have quality products at a reasonable price, and the dealer must inform the customer why certain products have quality. Customers respond to this type of selling, he reports.

Another business asset of Woodford Feed Co. is the neatness of the establishment. This neatness is admired by customers. The farm store at the front is neat, and so is the mill, seed department and warehouse areas. This reflects good storekeeping, and Mr. Cleveland likes to have merchandise and supplies in good condition so as to give top service to customers.

Thus versatility of operation and variety of products, plus service and competent feeding advice, are helping this dealer build a profitable volume of business.

SIGNS—Signs in the store are used to inform the customer of such things as cash discounts and pork program.

Firm Changes Name

NORFOLK, NEB. — The name of the Norfolk Cereal & Flour Mills Co., owned by the Bridge family for the last 75 years, has been changed to Norfolk Feed Mills Co., Robert Bridge, president, has announced.

There will be no change in ownership or officers.

Other officers are: G. Donald Bridge, chairman of the board; Charles A. Bridge, first vice president; Donald O. and William Bridge, vice presidents, and Glenn A. Briggs, secretary-treasurer.

FEED FIRM OPENS

OSKALOOSA, IOWA—Van's Feed Service recently opened for business here with E. J. Engelenhoven, proprietor. Foxbilt Feeds, Ames In-Cross chicks, boars, gilts and seed are among the products to be handled.

Research Needed On Hay Pelleting, Dairy Men Told

SACRAMENTO, CAL.—Much research work remains before any definite relationship between hay pellet feeding and butterfat production in dairy cattle can be recorded, a speaker told the Yuba-Sutter Dairy Herd Improvement Assn.

Dr. Magnar Ronning, University of California, Davis, told the association's annual session at Linda, Yuba County, that recent research has resulted in an untested theory that pellets may be directly responsible for the amount of rumen fermentation activity in the cow's stomach.

Test cows took on the appearance of suffering from bloat, he said, which could have resulted from faster eating of the concentrated hay. Cows suffered appetite loss, ate less and production of butterfat dropped although the milk yield remained approximately the same.

If the theory can be proved, Dr. Ronning said, pellets would be well adapted to mechanical feeding with the material put before the cows in smaller amounts over longer periods of time.

He said that the feeding of 6-10 lb. of bale type hay with pellets and concentrates will eliminate the butterfat drop. In addition, the bale type hay can be of low quality.

"The economic feasibility of pellets is yet to be proved," said Dr. Ronning. He said that grinding and pelleting costs for research feeds have amounted to $12 per ton over the basic hay cost.

Superior Separator Reports 'Best Year'

HOPKINS, MINN. — "The best year in the company's history" was reported by the Superior Separator Co., manufacturer of agricultural implements and industrial processing equipment. Sales topped $13 million, surpassing 1958 by 29%. Net income of $493,787 showed an increase of 79% and earnings per share rose from $2.51 to $4.50.

The report noted the acquisition of two companies: West Coast Sales & Service Co., Tulare, Cal., manufacturer of Morrill wheel-type rakes, and Central Oregon Iron Works, Inc., Bend, Ore., manufacturer of bulk feed tanks and machinery for the lumber industry.

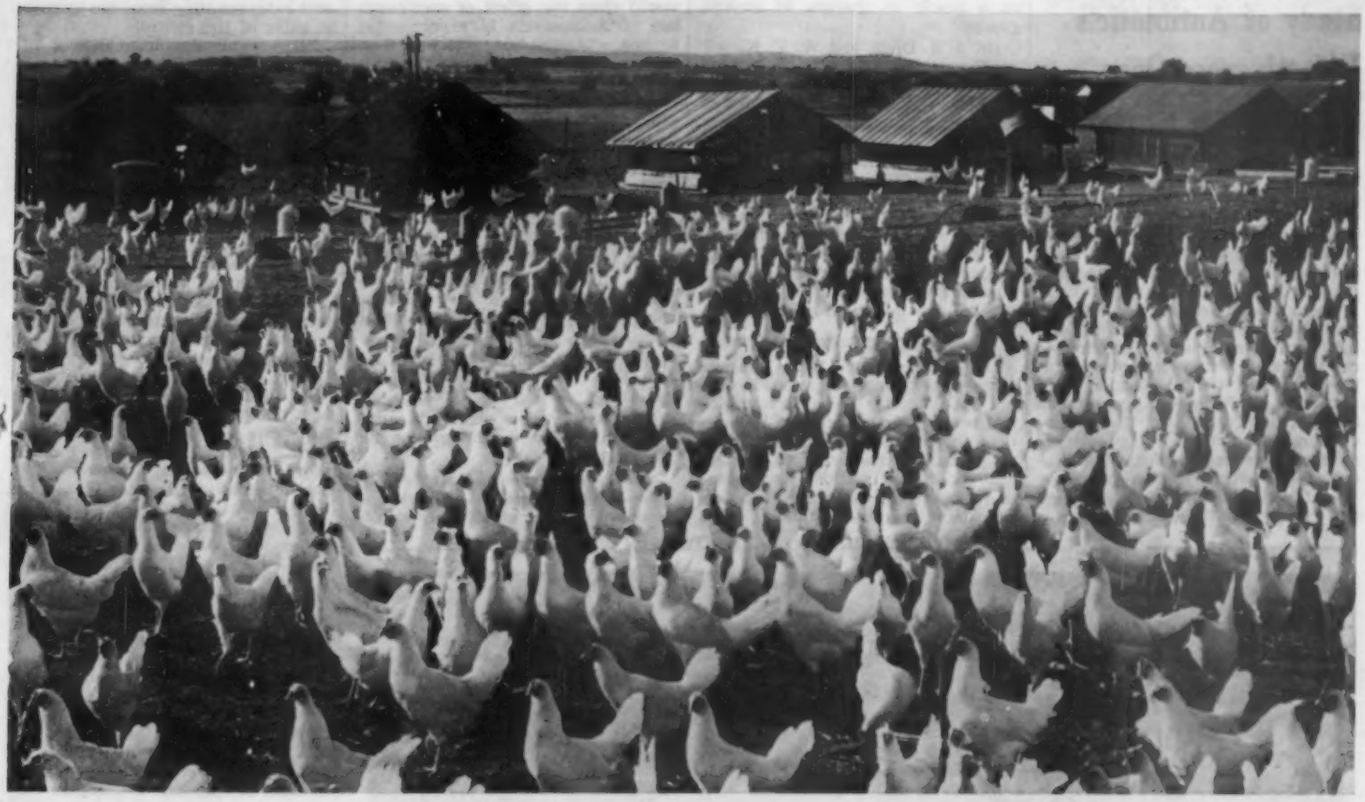
All four of the company's divisions reported improved operations—the Farmhand division, which manufactures and distributes implements; the Fluidizer division, manufacturer of air conveying equipment; the Superior division, which makes grain, feed and seed processing machinery, and the export division.

McMillen Feed Mills Names Sales Official

FORT WAYNE, IND.—Promotion of Joseph W. Hasler to assistant to the director of feed sales has been announced by McMillen Feed Mills here.

J. W. Hasler

Mr. Hasler joined McMillen Feed Mills in June, 1956. He has served as assistant territory manager in the Ohio district, administrative assistant on the feed sales staff and as assistant advertising manager. Mr. Hasler is a 1956 graduate of Purdue University, where he majored in agricultural economics.



GUARANTEED ANALYSIS OF T-H MIX FOR POULTRY

1

(for Chick and Broiler Starter Rations)

GUARANTEED ANALYSIS	PER POUND
Vitamin A	200,000 USP Units
Vitamin D_3	200,000 I.C. Units
Vitamin B_{12}	0.6 Mgs.
Riboflavin	150.0 Mgs.
d-Pantothenic Acid	500.0 Mgs.
Niacin	2,000.0 Mgs.
Choline Chloride	10,000.0 Mgs.
Vitamin E	100.0 I.U.
Menadione Sodium Bisulfite	200.0 Mgs.
Methionine Hydroxy Analogue	0.075 Lbs.
1,2-Dihydro-6-Ethoxy-2,2,4-Trimethylquinoline	0.025 Lbs.
Manganese	3,234.0 Mgs.
Zinc	7,945.0 Mgs.
Feed Grade Zinc Bacitracin	0.5 Grams

2

(for Chick Grower, Poultry Laying, Breeding and Concentrates Rations)

GUARANTEED ANALYSIS	PER POUND
Vitamin A	500,000 USP Units
Vitamin D_3	100,000 I.C. Units
Vitamin B_{12}	0.6 Mgs.
Riboflavin	100.0 Mgs.
d-Pantothenic Acid	500.0 Mgs.
Niacin	1,000.0 Mgs.
Choline Chloride	5,000.0 Mgs.
Menadione Sodium Bisulfite	50.0 Mgs.
Vitamin E	100.0 I.U.
1,2-Dihydro-6-Ethoxy-2,2,4-Trimethylquinoline	0.025 Lbs.
Manganese	3,234.0 Mgs.
Zinc	7,945.0 Mgs.
Feed Grade Zinc Bacitracin	0.5 Grams

3

(for Broiler Grower Rations)

GUARANTEED ANALYSIS	PER POUND
Vitamin A	120,000 USP Units
Vitamin D_3	50,000 I.C. Units
Vitamin B_{12}	0.6 Mgs.
Riboflavin	200.0 Mgs.
d-Pantothenic Acid	500.0 Mgs.
Niacin	1,000.0 Mgs.
Choline Chloride	6,000.0 Mgs.
Menadione Sodium Bisulfite	50.0 Mgs.
Methionine Hydroxy Analogue	0.05 Lbs.
1,2-Dihydro-6-Ethoxy-2,2,4-Trimethylquinoline	0.025 Lbs.
Manganese	3,234.0 Mgs.
Zinc	7,945.0 Mgs.
Feed Grade Zinc Bacitracin	0.5 Grams

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Study of Antibiotic's Effectiveness Over Long Period Reported

NEW YORK—A feed supplement manufacturer's survey and analysis of agricultural experiment station data covering a decade indicates that the practice of feeding swine an antibiotic over a long period of time has not resulted in reduced effectiveness of the antibacterial agent.

There was no evidence found in the study that gains of pigs fed the antibiotic are changing with time. American Cyanamid Co., investigators, who have reported on "Production Performance of Swine at Experiment Stations 10 Years After the Introduction of Aureomycin," say the results of their study indicate that the differences in gains between groups of antibiotic-treated swine and control groups "are decreasing primarily as a result of changes in control groups."

Dr. J. J. Drain and W. F. Kwoek of Cyanamid's agricultural division explained in their report to the 10th Animal Feed Symposium, sponsored by the company, "In antibiotic experiments the effect of the antibacterial agent may go beyond the treated group and lower the incidence of disease in the associated untreated control group. The result of this carryover effect would be manifested not only in an improvement in the production of the treated group but also an improvement in the performance of the untreated controls."

Data from Experiment Stations

Dr. Drain reported that Cyanamid research personnel, interested in finding out what the trends are in animal performance as affected by long-time supplementation with Aureomycin, initiated a survey. State and federal experiment stations were asked to submit controlled animal production data from their stations which would show the effect of continuous use of Aureomycin in experimental rations. "Antibiotics other than Aureomycin were not included in this study," Dr. Drain said, "and the results presented cannot be applied to other antibacterial agents."

In the study, conducted to determine the time trend in the effectiveness of Aureomycin when fed to growing-finishing swine, production data (average daily gains and feed efficiencies) on 3,271 pigs were collected from 13 experiment stations.

The authors of the Cyanamid symposium report listed the following changes in production in relation to time:

"1. Average daily gains of pigs fed control rations increased at a significant rate.

"2. There was no change in average daily gains in the groups fed Aureomycin.

"3. The difference in average daily gains between treated and control groups decreased at a highly significant rate, resulting from the increase in gains of the controls.

"4. A highly significant rate of improvement was detected in feed efficiency for both treated and control groups.

"5. The differences in feed efficiency between treated and control groups remained unchanged."

Beneficial Effect

In the summary of their report, the researchers said the results with growing-finishing swine show that, "in consecutive controlled experiments with antibiotics conducted on confined premises, the beneficial effect of the antibacterial agent not only is evidenced in the groups fed the drug but also the control groups."

They continued, "Based on the results reported, there is no evidence of a diminishing trend in production with time. On the contrary, the conversion of feedstuffs to pork has improved considerably throughout a decade of swine feeding. What portion of this improvement can be attributed to advances in nutrition, genetics or husbandry remains unknown. However, it is apparent that the addition of Aureomycin to growing-finishing rations results in further improvements in production by virtue of its protecting influence on animal health."

An observation the Cyanamid investigators made regarding "a very important aspect in reporting results of experiments with antibiotics" was this: "Many investigators have used the phrase 'lower antibiotic response' or 'lack of response' to compare current results with past results. The fallacy of this phraseology is obvious, namely, no reference is made to trends in animal production."

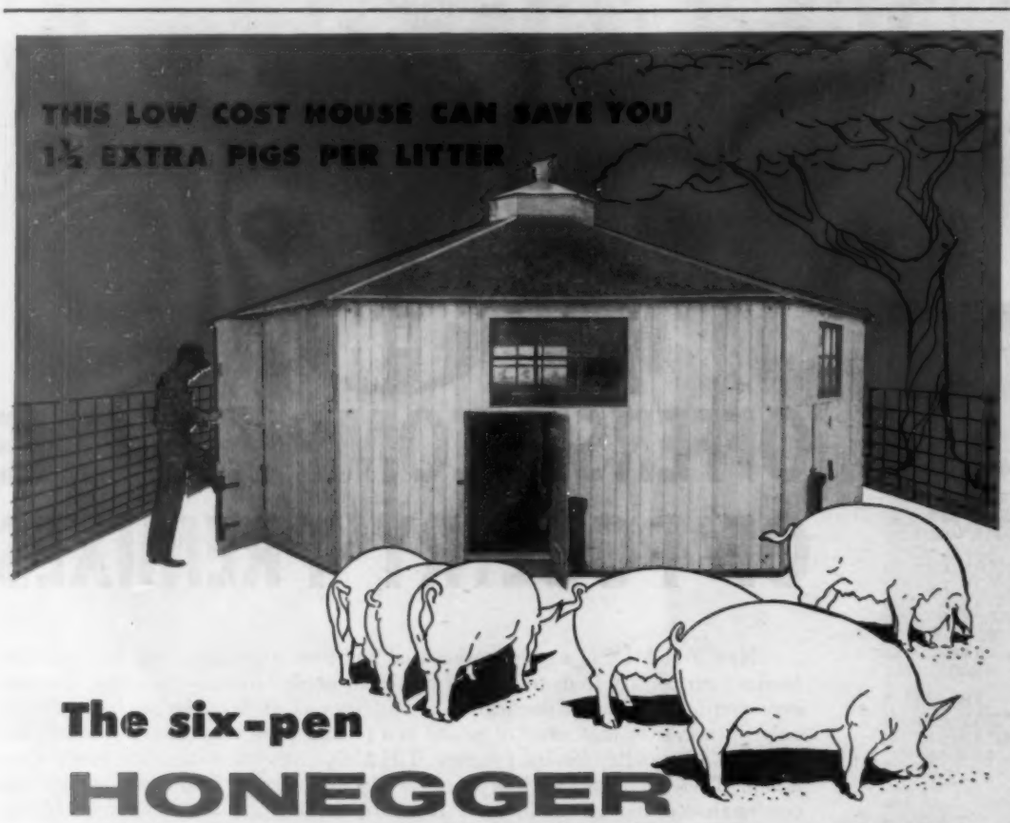
Commenting on the method of assembling data for their study, Dr. Drain and Mr. Kwoek said, "Because environmental factors relating to animal health, such as disease, stress, temperature, vaccination, etc., affect the results of antibiotic experiments more than the results of nutritional experiments, it is necessary to have several consecutive experiments in many locales to properly evaluate antibiotic effects as related to an improvement or a decline in animal production over the years."

Their report explains that the earliest data used were from the fall of 1949 and the latest from the fall of 1958. Average daily gains and feed conversion factors were used to measure the production performance of growing-finishing swine. Pigs used to measure trends in average daily gains consisted of 1,314 controls and 1,880 fed Aureomycin. Feed conversion trends were computed on 1,338 controls and 1,933 treated pigs. The average starting weight was 42 lb. and the experiments were terminated when the pigs attained market weight.

Dr. Drain said the average amount of Aureomycin added per ton of ration was 20 gm., and ranged from 9 to 100 gm.

For the respective control and treated groups the improvements in feed requirements per pound of gain were .29 lb. and .23 lb. for the 9½ year period covered by the tests from which the data for the study was obtained.

"It appears that although there tends to be a decrease in differences with time, the values for control and treated groups are not converging, as evidenced by a lack of significance when the feed efficiency differences between treated and control groups were analyzed," the researchers said. "Rather, the feed requirements per pound of gain have averaged a relatively constant .11 lb. apart throughout the 9½-year period."



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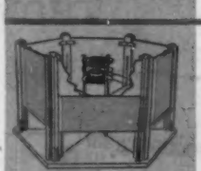

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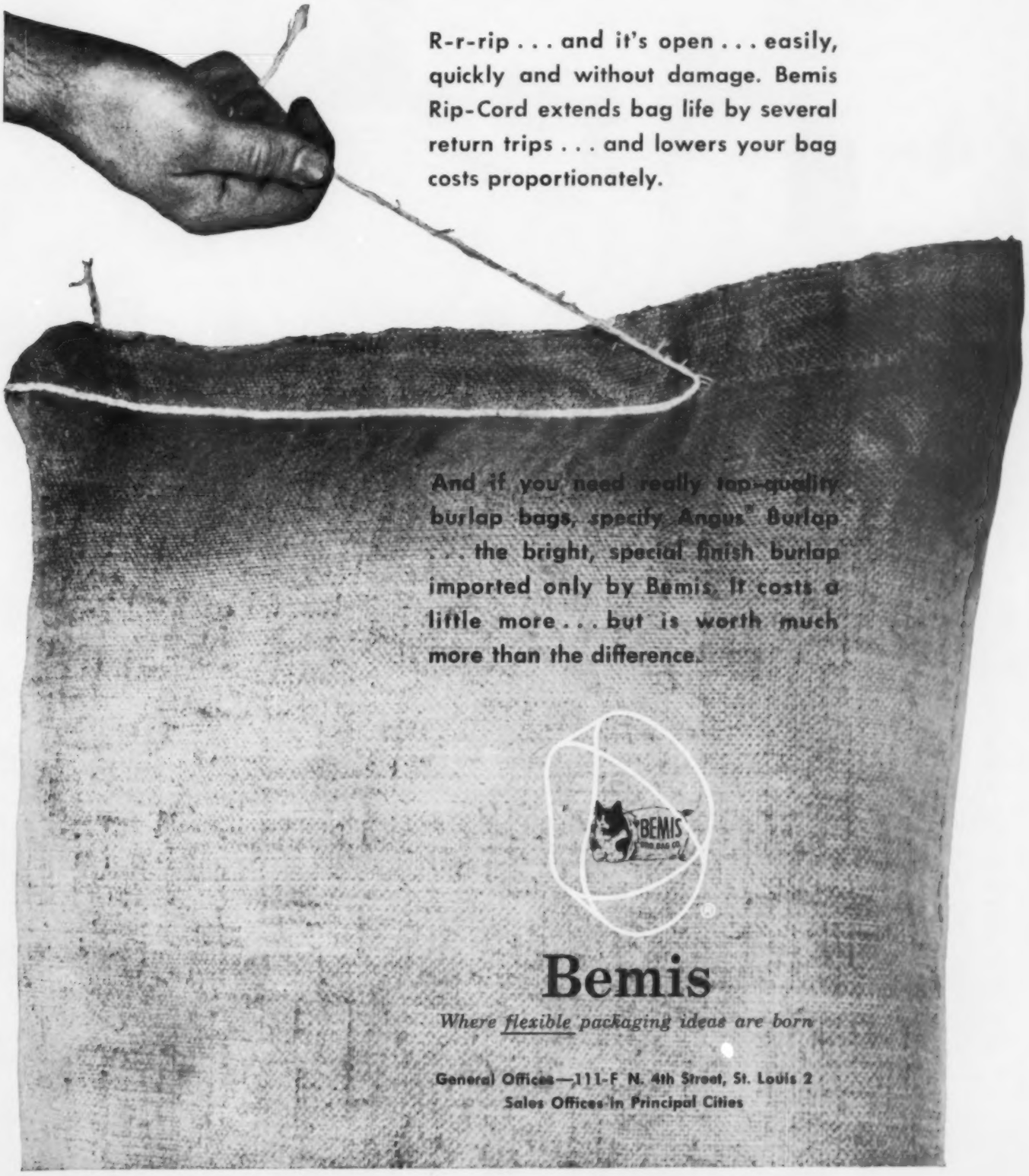

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Suggestions on Nutrient Requirements of the Pig

"Nutrient requirement standards are only a guide, and they may not be the final answer to the exact needs of the pig under all circumstances."

By Dr. T. J. Cunha
Florida Agricultural Experiment Station

It is always difficult to give exact recommendations on nutrient requirements of animals. This is because there are many factors, both known and unknown, which will affect nutrient needs.

NEEDS OF ANIMALS VARY — Most of the nutritive requirements of animals are based on the performance of a group of animals. Thus, the nutrient may be adequate for some of the animals, but it may be deficient for some animals which have a higher requirement or for some reason do not utilize it efficiently.

One such example is the Michigan study (2) which showed that a level of 4.15 mg. of pantothenic acid per pound of feed was adequate for only 5 of the 10 pigs in the experimental group. These five gained normally and at no time showed any signs of a deficiency. The other five pigs, however, showed typical pantothenic acid deficiency symptoms as evidenced by locomotor incoordination. This experiment definitely shows that individual animals will vary in their requirements of nutrients.

AVAILABILITY OF NUTRIENTS VARIES — Undoubtedly there are also differences in the availability of nutrients depending on their form as well as their feed source. There, undoubtedly, is also a difference between the availability of these nutrients as determined by a chemical analysis or a microbiological assay and as determined by the use the pig will make of them.

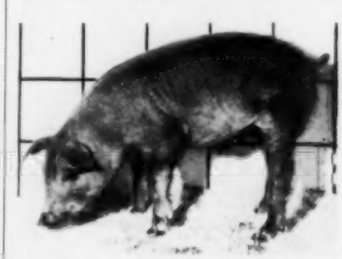
EDITOR'S NOTE: Dr. T. J. Cunha is head of the department of animal husbandry and nutrition at Florida. He also is a member of the swine nutrients requirement committee of the National Research Council. He has been a member of this group since 1951. He is the author of the widely used text, "Swine Feeding and Nutrition," published in 1957. Dr. Cunha received his Ph.D. in animal nutrition at the University of Wisconsin in 1944 and was on the staff of Washington State College before going to Florida.

Their use by the pig may be different from the figures published on the nutrient analyses by various assay methods. This does not mean that analytical values are not important —they definitely are. It does mean, however, that some degree of reservation must be used, and that some provision should be made for taking care of a possible difference in availability.

PURIFIED VS. NATURAL RATIONS—It must also be stressed that most of the nutrient requirements worked out for the pig have been obtained by using purified rations. Yet we apply this information directly to natural or practical rations as are used on the farm. In natural rations, these nutrients are contained in their natural state. In most cases, they are in different forms than when they are fed in purified or laboratory diets. Thus there is likely to be a difference in their availability and consequently some difference in requirements as worked out with purified and natural rations. This does not impair the value of purified rations in determining nutrient requirements, but it does indicate that some degree of reservation needs to be used and that the nutrients also need to be studied with natural rations as well.

NUTRIENT REQUIREMENTS MAY BE TOO LOW—We also need more extensive studies on nutrient requirements which involve data other than rate of gain and feed efficiency. For example, a Michigan study (3) showed that .5 mg. of pyridoxine per kilogram of solids was nearly adequate for good growth and feed conversion with the baby pig. However, when the blood (hemoglobin, red blood cells, etc.) and urinary xanthurenic acid constituents were taken into consideration, the pyridoxine requirement was shown to be higher. It was greater than .75 mg. but less than 1 mg. per kilogram of solids.

This study showed that, to obtain a reliable figure on the pyridoxine needs of the pig, one needs to obtain data on blood and other constituents in addition to the usual growth and feed efficiency information which are the only criteria used by many investigators. Of course, even better would be histopathological data which might show the requirement of nutrients to be even higher. An example of this is a paper presented by Dr. J. A. Hoefer of Michigan State at the 1959 American Society of Animal Production meetings. He stated that a low level of calcium seemed to be adequate for the growing pigs as far as growth rate and feed efficiency was concerned but,



B_{12} DEFICIENCY—This vitamin is borderline in many swine rations. A lack of it results in slower growth, dermatitis and other symptoms. (Courtesy D. V. Catron, Iowa State Agricultural Experiment Station)

RIBOFLAVIN DEFICIENCY—Many rations are borderline and many are deficient in this vitamin. A lack of riboflavin will decrease growth, feed efficiency and cause many other deficiency symptoms. (Courtesy R. W. Luecke, Michigan Agricultural Experiment Station)

VITAMIN D DEFICIENCY—Note the abnormal legs and the inability to stand properly. Vitamin D is needed for efficient utilization of calcium and phosphorus and, thus, for normal calcification of bone. (Courtesy of R. M. Bethke, Ohio Agricultural Experiment Station and Ralston Purina Co.)

TABLE 1—Nutrient Requirements of Growing and Finishing Pigs**
(Expressed in percentage or amount per pound of total ration)

	Growing Pigs			Finishing Pigs (Self-Fed)					
				Meat Type			Bacon Type*		
Liveweight, lb.	10	25	50	100	150	200	100	150	200
Expected daily gain, lb.	0.5	0.8	1.2	1.6	1.7	1.9	1.5	1.7	1.7
Protein and energy:									
Crude protein, %	24	17	15†	13	12	12	16	14	14
Total digestible nutrients, %	80	80	75	75	75	75	70‡	70‡	70‡
Digestible energy, Kcal.¶	1600	1600	1500	1500	1500	1500	1400	1400	1400
Inorganic nutrients:									
Calcium, %	0.70	0.65	0.65	0.50	0.50	0.50	0.50	0.50	0.50
Phosphorus, %	0.60	0.50	0.50	0.40	0.40	0.40	0.40	0.40	0.40
Salt (NaCl.), %	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Vitamins:									
Carotene, mg.§	1.5	1.12	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Vitamin A, I.U.§	800	600	400	400	400	400	400	400	400
Vitamin D, I.U.	100	90	90	60	60	60	60	60	60
Thiamine, mg.	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Riboflavin, mg.	1.5	1.4	1.2	1.0	1.0	1.0	1.0	1.0	1.0
Niacin, mg.	10.0	8.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Pantothenic acid, mg.	6.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
Pyridoxine, mg.	0.5	0.5	0.5	..	..	..	..	..	..
Choline, mg.	500.0	400.0	..	..	..	..	..	..	..
Vitamin B_{12}, mcg.	10.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

**Recommendations of National Research Council committee on "Nutrient Requirements of Swine" in 1959 (1).
*It usually requires two weeks longer to produce a 200-lb. bacon-type hog than a 200-lb. meat-type hog.
†For bacon-type hog feed 16% crude protein.
‡Rations for barrows being finished for bacon should contain 67% TDN or 1354 kilocalories of digestible energy per pound.
¶Digestible energy was calculated on the assumption that 1 lb. of TDN has 2,000 Kcal. of digestible energy.
§Carotene and vitamin A values based on 1 mg. carotene equals 533 I.U. vitamin A for the pig. Vitamin A requirements can be met by either carotene or vitamin A; both are not needed.

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VITAMIN A DEFICIENCY—Note the weakness of hind legs and curvature of the spine (lordosis). Many swine rations are lacking in this vitamin. (Courtesy of J. F. Hentges, Jr., Wisconsin Agricultural Experiment Station)

when histopathology data was taken into consideration, then a higher level of calcium was indicated.

These are just two examples to illustrate the fact that many of our established nutrient requirements might be shown to be too low if more exacting criteria were used to determine what an adequate nutrient level really is. We need more studies on blood, tissue and histopathology when determining nutrient needs of the pig. Only then will we get accurate data on actual needs.

NEED FOLLOW-UP STUDIES—We also need to follow up growth studies to determine if the animals have developed normal reproductive tracts during growth and thus would be good producing replacement animals if kept for the breeding herd. Most studies on nutrient needs during growth have not been followed up with gestation and lactation studies to determine if the nutrient level was adequate to develop a normal reproductive tract during the growing period. Until this is done, I am afraid that in many cases we may be misled on the adequacy of certain nutrient needs during growth for animals kept for breeding purposes later on. The fact that a ration gives a good, or even the best rate of gain and feed efficiency during growth, is no assurance that the ration has been adequate to develop a normal reproductive tract so that the animal can conceive, reproduce and lactate properly later on.

An example to illustrate this is the studies at Wisconsin (4), Washington (5), and Purdue (6) which showed that the ration fed during growth influenced the ability of the pig to conceive, reproduce and lactate many months later. In many cases, the rations which gave the best results during growth, as far as rate of gain was concerned, gave the poorest results later on during gestation and lactation. Thus, we need studies which involve the entire life cycle of the pig and which take into account the various phases of the life cycle and the specific nutrient needs during each phase and how they affect requirements during the other phases.

NUTRIENT INTERRELATIONSHIPS—Interrelationships of nutrients should also be taken into consideration in determining nutrient needs. There are many nutrients which will affect the needs of others. A few examples are choline and methionine, methionine and cystine, phenylalanine and tyrosine, niacin and tryptophan. These and others are discussed by the author (7) in considerable detail. Suffice it to say, however, that accurate needs of many nutrients cannot be determined without knowing the level and needs of the others.

STRESS MUST BE CONSIDERED—Stress should also be taken into consideration in determining nutrient needs. Conditions of stress such as disease level (sub-clinical), poor feeding and management can also alter the need for certain nutrients and feed additives. This is one reason why field trials, properly conducted, are of considerable value in evaluating the adequacy of rations.

It must be remembered that experiment station trials are almost always conducted with good quality feeds and with good management and good sanitation. Thus, the results obtained at the experiment station may be altered somewhat on the average farm where poorer quality feeds may be used and where management, sanitation and other production practices may not be as good. This is the reason why certain stress feeds are needed and why certain nutrients and additives are used at higher levels to take care of stress conditions. Higher levels of nutrients and feed additives should be used with extreme care, however, since some nutrients can cause harmful effects if used at too high levels.

CARCASS QUALITY STUDIES NEEDED—Carcass quality information is also needed when studying nutrient needs. More of our feeding trials are being followed with carcass data, but too many still are not. It may be possible that level of nutrients used may affect carcass quality, and this type of information is very meager.

For example, Danish data indicate that the kind of protein supplement used affects the fat content of the carcass, although it may not affect rate and efficiency of gain (8). In Denmark, they have not been able to replace skim milk with other protein supplements and still get as good a carcass. Other protein supplements increase the fat content of the carcass. Their data would indicate that it should be important to find out what skim milk is supplying and/or why it is better than other protein supplements for producing a superior carcass under their conditions. It might be due to amino acids (either level or balance) but on the other hand it could be due to something else. With the great need for pork with more lean and less fat in the U.S., it is imperative that more studies take into account the effect of nutrient intake on carcass quality.

NUTRIENT REQUIREMENTS ARE A GUIDE—This discussion indicates that nutrient requirement standards are only a guide, and that they may not be the final answer to the exact needs of the pig under all circumstances. It means that some margin of safety with level of nutrients may be desirable in compounding rations and especially with nutrients which are not very stable and which may be slowly and gradually destroyed by long storage.

It also means that a swine feeding trial is still the final criterion as to whether a certain combination of feeds mixed by a feeder or feed manufacturer is adequate in all nutrients. Thus, the only sure way to know whether a ration lacks certain nutrients for the pig is to run a feeding trial and determine whether or not the addition of the nutrient is beneficial. This means that those compounding feeds need to conduct trials to determine the nutrients plus other feed additives and their levels needed with their type of rations and under the conditions they will be used. Only then will they definitely know whether their ration is adequate in nutrients or in feed additives.

SUGGESTED REQUIREMENTS

ZINC WILL PREVENT THIS—Many pigs still suffer from parakeratosis. Excess calcium will cause this condition and zinc supplementation will cure and prevent this. (Courtesy Florida Agricultural Experiment Station)

TABLE 2—Nutrient Requirements of Breeding Stock**
(Expressed in percentage or amount per pound of total ration)

	Bred		Breeding Stock Lactating		Boars	
	Gilts	Sows	Gilts	Sows	Young	Adult
Liveweight, lb.	300	500	350	450	300	500
Expected daily gain, lb.	1.0	0.7	...	...	1.0	...
Protein and energy:						
Crude protein, %	15	13	15	13	15	13
Total digestible nutrients, %	70	70	75	75	70	70
Digestible energy, Kcal.*	1400	1400	1500	1500	1400	1400
Inorganic nutrients:						
Calcium, %	0.6	0.6	0.6	0.6	0.6	0.6
Phosphorus, %	0.4	0.4	0.4	0.4	0.4	0.4
Salt (NaCl), %	0.5	0.5	0.5	0.5	0.5	0.5
Vitamins:						
Carotene, mg.†	2.5	2.5	2.5	2.5	2.5	2.5
Vitamin A, I.U.†	1200	1200	1200	1200	1200	1200
Vitamin D, I.U.	60	60	60	60	60	60
Thiamine, mg.	0.5	0.5	0.5	0.5	0.5	0.5
Riboflavin, mg.	1.5	1.5	1.5	1.5	1.5	1.5
Niacin, mg.	5.0	5.0	5.0	5.0	5.0	5.0
Pantothenic acid, mg.	6.0	6.0	6.0	6.0	6.0	6.0
Pyridoxine mg.	..	..	..	..	..	..
Choline, mg.	..	..	..	..	..	..
Vitamin B_{12}, mcg.	5.0	5.0	5.0	5.0	5.0	5.0

*Digestible energy was calculated on the assumption that 1 lb. of TDN has 2,000 Kcal. of digestible energy.
†Carotene and vitamin A values based on 1 mg. carotene equals 533 I.U. vitamin A for the pig. Vitamin A requirements can be met by either carotene or vitamin A; both are not needed.
**Recommendations of National Research Council Committee on "Nutrient Requirements of Swine" in 1959 (1).

TABLE 3. Essential Amino Acid Requirements of Pigs*

Amino Acid	Percentage of Total Diet: Baby Pigs, 5-10 lb.	Growing Pigs, 25-70 lb.
L-Arginine	..	.20
L-Histidine	.20	.20
L-Isoleucine	.76	.60
L-Leucine	1.25‡	.60
L-Lysine	.94‡	.65
DL-Methionine§	..	.60
DL-Phenylalanine†	..	.50
L-Threonine	.90‡	.40
DL-Tryptophan	..	.20
L-Valine	..	.40

§Cystine can replace one-half (.3%) of the methionine requirement.
†Tyrosine can replace 30% (.15%) of the phenylalanine requirement.
‡This level is adequate but minimum requirement has not been established.
*Recommendations of National Research Council Committee on "Nutrient Requirements of Swine" in 1959 (1).

FOR THE PIG—The data shown in Tables 1, 2, 3, 4 and 5 are the recommendations of the National Research Council Committee on "Nutritive Requirements of the Pig" (1). These requirements are based on experimental studies and are the best figures which the committee felt could be arrived at based on the data available at the present time.

These recommended levels are very close to actual requirements and no safety factor was allowed for destruction of nutrients in the feed on storage or for stress or other conditions which might increase the need for nutrients or antibiotics. The feeder or feed manufacturer may want to apply a safety factor in the levels used, depending on the rations and the conditions under which they will be handled, stored and fed.

DISCUSSION OF REQUIREMENTS—The following discussion is the author's opinion concerning the nutrient needs of the pig. It will help clarify some of the requirements which are recommended by the National Research Council.

Protein—The recommended levels for the growing-finishing pig shown in Table 1 are a little higher than has been shown to be needed in many cases. These slightly higher levels are suggested in order to provide some protection against poor quality protein supplements and/or other feeds used. It is realized that the 125 lb. pigs can get by with about 10 or 11% protein. However, grains will many times supply this amount of total protein. Since grains are low in certain amino acids, it is recommended that grain not be used as the sole source of protein for heavier pigs. It is suggested that enough of a protein supplement be added to insure an adequate amount and a proper balance of the amino acids.

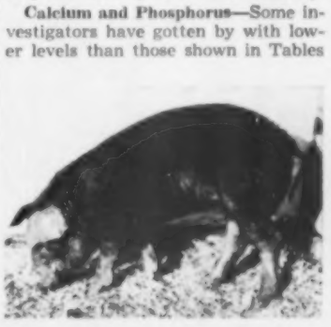
Amino Acids—The data in Table 3 show the limited data which are available on amino acid requirements of the pig. The three essential amino acids which are likely to be low or borderline in swine rations are methionine, lysine and tryptophan. It is also possible that histidine may occasionally be borderline. Studies on amino acids are rather complicated and difficult to evaluate.

CALCIUM DEFICIENCY—This pig will soon lose control of its hind legs. A lack of calcium will cause this and an excess of calcium can cause parakeratosis. Thus, one should use proper levels in the ration. (Courtesy C. E. Aubel and J. S. Hughes, Kansas Agricultural Experiment Station)

This is because amino acids need to be fed at the right time, in the right amount and balance to one another as well as in the correct form. This means that, if one adds an amino acid to a ration and the pig does not respond, the ration may still lack the amino acid. The response did not occur because all conditions were not optimum. This accounts for investigators sometimes getting beneficial results and other times no response.

In other words, those working on amino acid supplementation will need to realize the complexity involved and not draw concusions too soon on experiments which do not explore all angles of the problem. It is also suggested that carcass quality be evaluated on amino acid supplementation studies, since they might possibly affect the carcass even though they may not affect gain or feed efficiency.

Calcium and Phosphorus—Some investigators have gotten by with lower levels than those shown in Tables



AMINO ACID DEFICIENCY—This tryptophan-deficient pig lost 8 lb. in three weeks, showing the importance of not having an amino acid deficiency. Adequate protein and a proper balance and level of amino acids are needed for proper ration utilization by the pigs. (Courtesy W. M. Beeson, Purdue Agricultural Experiment Station)

PHOSPHORUS DEFICIENCY — A lack of phosphorus causes abnormal bone formation. A large excess of either calcium or phosphorus interferes with the absorption of the other. Thus, it is important to have a proper ratio between calcium and phosphorus. (Courtesy W. M. Beeson, Purdue Agricultural Experiment Station)

1 and 2. In many cases, however, blood and bone ash data were not obtained to verify whether the levels were adequate to take care of bone and other body needs. Much more work is needed to determine more specifically what the calcium and phosphorus needs are under varying conditions. Studies during the last few years indicate we are not too sure what those needs are.

Zinc—The recommended level of 23 mg. per lb. of ration in Table 4 amounts to 50 p.p.m. The Purdue station (9) recently showed the requirement of the very young pig to be about 50 p.pm. when a level of .66% Ca and .47% P was used. However, levels higher than 50 p.p.m. of zinc may be needed, if excess calcium is used in the ration. When the calcium level becomes too excessive (1.5 2% of the ration), the use of zinc at 100 p.p.m. will not always completely prevent the growth depression and poor feed conversion associated with parakeratosis, although it will prevent the typical skin lesions (10).

Since many pigs get more calcium than they need, and since we are still not too sure as to what the definite calcium needs of the pig are, it is recommended that at least 100 p.p.m. of zinc be used in swine rations. This level might even be increased to 125 or 150 p.p.m., if for some reason extra high levels of calcium are consumed by the pig. A little excess zinc should do no harm since Wisconsin workers (11) have observed no toxic effects from self-feeding a ration containing 1,000 p.p.m. of supplemental zinc for growing-fattening pigs.

However, too high a level of zinc is toxic, as shown recently by Illinois workers (12). The addition of .2% reagent grade zinc carbonate (2,000 p.p.m.) was the maximum level tolerated by weanling pigs fed corn-soybean oil meal diets. Higher levels produced toxicity characterized by depressed rate and efficiency of gain and a lower feed intake. In addition, arthritis, extensive hemorrhage in the axillary space, gastritis, catarrhal enteritis, congestion of the mesentery and hemorrhages in the ventricles of the brain, lymph nodes and spleen were observed. Feeding the high levels of zinc frequently caused death within 21 days.

TABLE 4. Trace Mineral Requirements of Swine*

Mineral element	Requirements in milligrams per lb.
Copper	4.5†
Iron	45.0†
Iodine	0.09
Magnesium	181.0
Manganese	18.0
Zinc	23.0‡

†Baby pig requirements.
‡Higher levels may be needed if excess calcium is used.
*Recommendations of National Research Council Committee on "Nutrient Requirements of Swine" in 1959 (1).

Manganese—The recommended level of 18 mg. per lb. of total rations in Table 4 amounts to 40 p.p.m. It is very possible, as some investigators think, that levels lower than 40 p.p.m. may be adequate. However, in view of the fact that Wisconsin workers (13) obtained beneficial effects by increasing the level on up to 40 p.p.m., there is every reason to believe that this level will be needed under some conditions. Excess manganese should be avoided since these same Wisconsin workers (13) found that a level of 500 p.p.m. of manganese resulted in deleterious effects.

Iron—A recent study by Michigan workers (14) has shown that the oral iron requirement for the baby pig is about 100 p.p.m. (45 mg. per lb. of feed). Thus, this level which is recommended in Table 4, should be more than adequate for the pig from 25-200 lb. in weight.

Copper—Since copper needs are usually about one-tenth the iron requirement, the recommended level of 10 p.p.m. (4.5 mg. per lb. of feed) shown in Table 4 should be adequate and especially so with pigs weighing 25 lb. and over.

English studies (15,16) and a recent Iowa study (21) showed that 250 p.p.m. of copper in the ration increased growth in the pig. Florida studies (17,18,19), however, have shown that an occasional pig will die, and daily gains and efficiency of feed utilization are decreased at levels of 150-250 p.p.m. of copper in the ration. A fading of the hair coat in Duroc pigs and a decrease in hemoglobin formation occurred at 200 p.p.m.

Only at 100 p.p.m. of copper did a slight but not significant increase in growth rate occur in the Florida work. A Michigan study (29) showed that a level of 125 p.p.m. of copper was of considerable benefit when added to the ration of weanling pigs. Of considerable interest was their finding that copper supplementation also gave protection against parakeratosis. This had also been previously observed in the Florida studies (18, 19). Thus, there is some interrelationship between copper and zinc and possibly some other mineral elements. Until more is known about these interrelationships and the conditions under which higher levels of copper may be helpful, it is not recommended that high levels of copper be used. If the high levels of copper caused harmful effects in the Florida studies, it is reasonable to assume they may also cause harmful effects elsewhere.

Vitamin A and Carotene—The levels shown in Tables 1 and 2 should be adequate. Higher levels might be used with the 25 lb. pig. This might be helpful, especially if the sow might be borderline in intake when pasture is not available and thus the pigs' intake and stores are low. Higher levels might also be used if the rations will be stored for long periods of time or under conditions where vitamin A activity might not be as stable as it should be.

Vitamin D—The levels shown in Tables 1 and 2 should be adequate. Recently, South Dakota workers (22) showed that vitamin D supplementation was of no benefit when added to a mixed corn-soybean oil meal-mineral ration fed in the absence of di-

(Turn to SUGGESTIONS, page 97)

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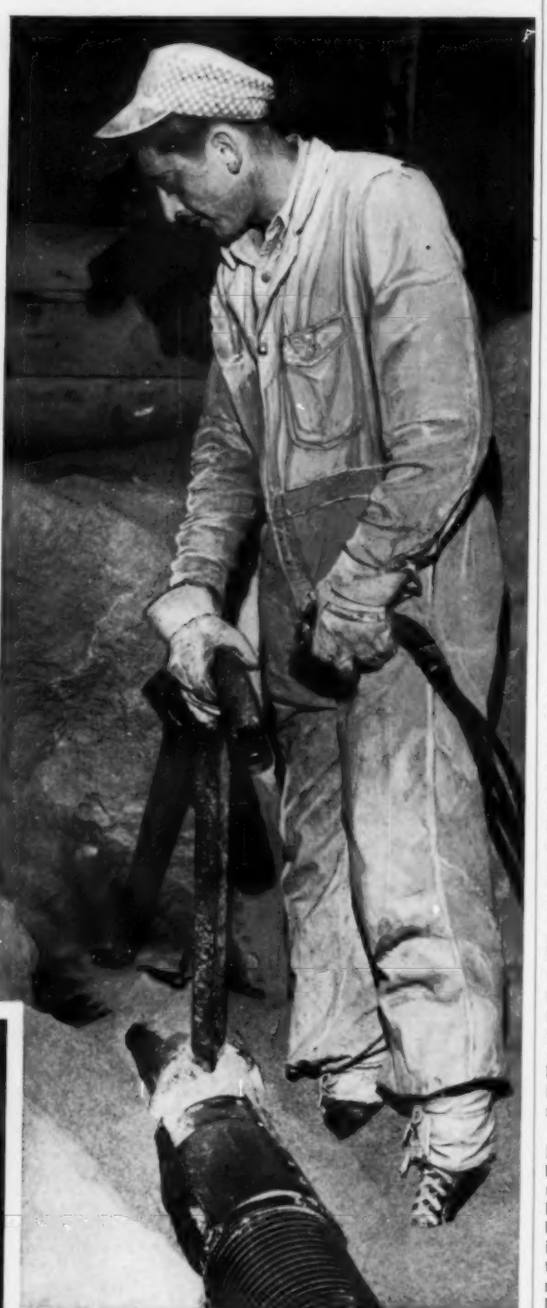

Operator controls unloading of feed ingredients at rate of 30 tons an hour — up 12 stories to storage, just by pushing a button.

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Illinois Company Remodels Plant To Fulfill Growing Demand for Bulk, Pellet, Custom Services

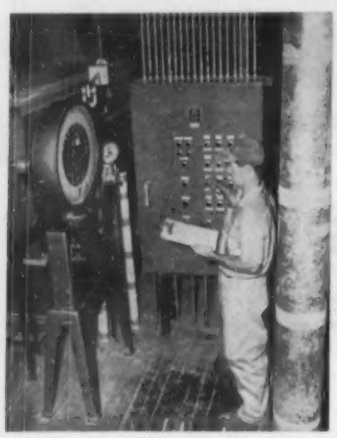
When executives of the M. D. King Milling Co. of Pittsfield, Ill., recognized that the capacity of their feed plant soon would be unable to keep up with the growing demand for King feeds they took a long, concentrated look at the present and into the future and saw that any expansion plans would have to include consideration of these factors:

● Most of King's feeds are sold directly to the feeder. Many of these customers buy feeds in relatively small quantities.

● King customers want their feeds tailored to the specific needs of their individual operations.

● Most customers like and feed pellets.

● Many customers consider bulk handling the most efficient and economical way of feeding.



PUSH-BUTTON OPERATION—Panel operator prepares feed in 2-ton batches, using 18 push-button stations. Screw conveyors move feed into 2-ton Toledo batching scale.

Survey Conducted

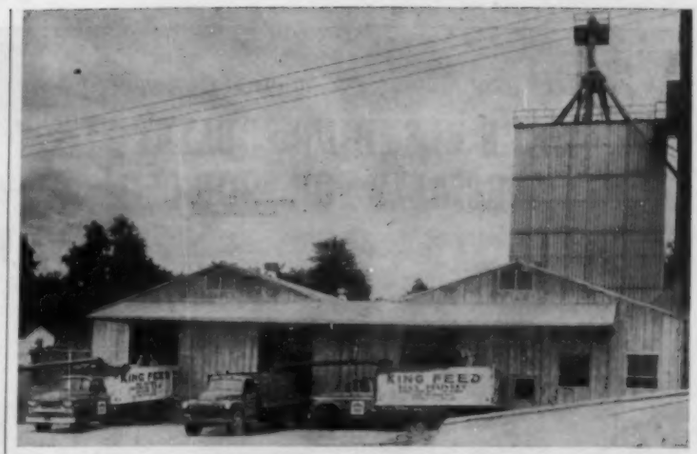
Officials of King Milling in 1957 employed Paul Berg, Ft. Wayne, Ind., consulting engineer, to conduct a survey of the territory served by the company to help them determine the type of mill best suited to meet the demand for King feeds.

Prompt action was necessary because in 1955 King feed tonnage reached an all-time high, and sales records were broken again in 1956 when a 15% production increase made it necessary for management to operate the plant 24 hours a day, many times six days a week.

The survey conducted for King Milling covered livestock production in western Illinois and eastern Missouri. It showed a great growth potential for commercial feeds and confirmed reports from Don Sloan, King sales manager, that continued increases in the company's feed volume could be expected.

After concluding that larger production facilities were a "must," the next decision by King executives was the choosing of an expansion plan which would utilize the five-story brick building formerly used by the company as a flour mill. King discontinued flour milling operations in 1950.

They knew that the plant would have to be flexible in its operation to meet the needs of independent feeders. It would have to be capable of economically handling small as well as large feed orders. It would have to be designed for bulk handling and pelleting.



NEW WAREHOUSE — King feed delivery trucks are loaded with finished feeds from new warehouse, which has 8,000 sq. ft. of storage space. Ingredient bins are housed in new structure shown in background at right.

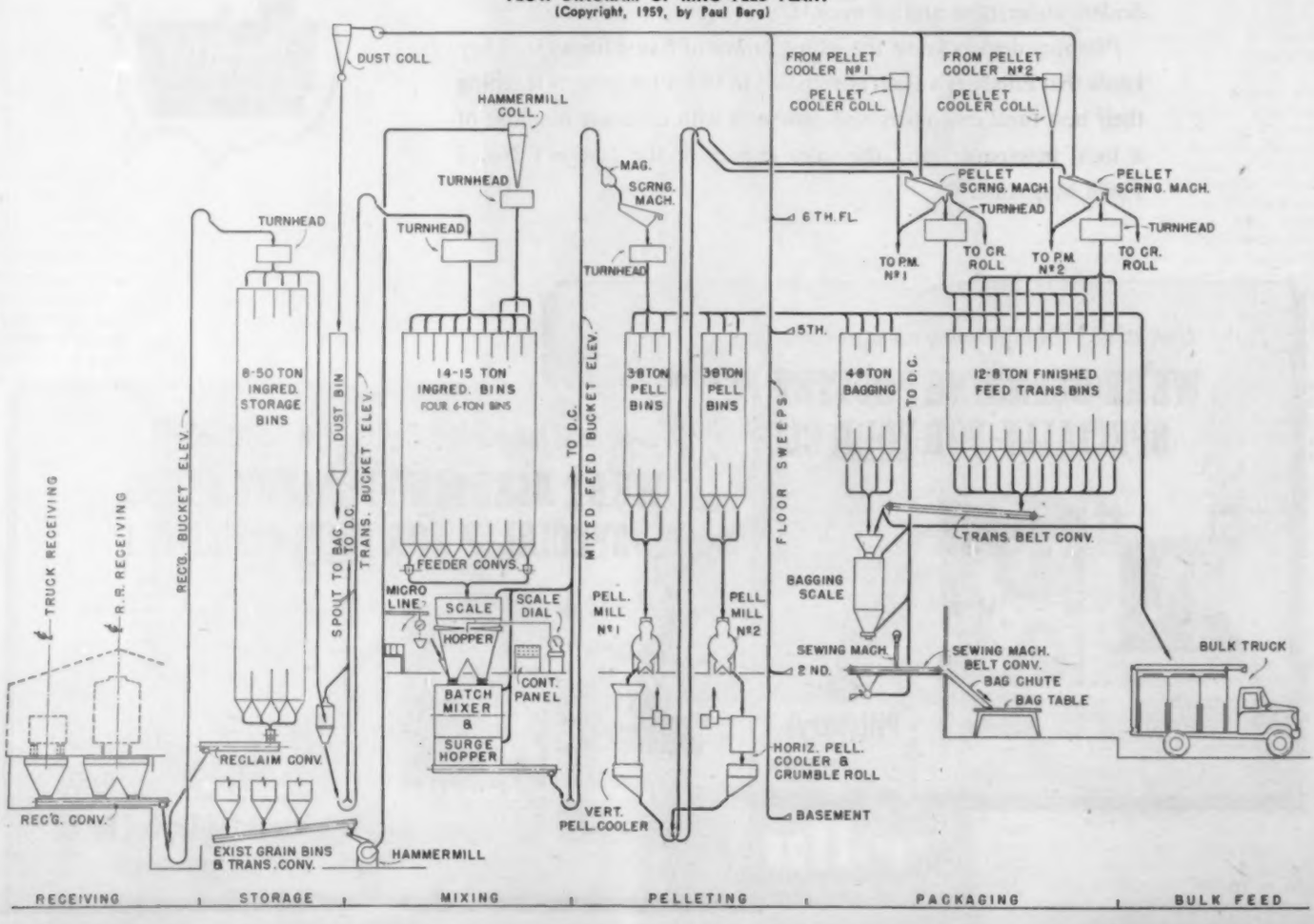
King Milling launched its expansion project with those requirements in mind. Mr. Berg was asked to design the new plant.

A warehouse and garage were demolished to make room for a new

WAREHOUSE INTERIOR—Fork lift truck operator handles a ton of sacked pellets taken from long stack of stored feeds in new King Milling Co. warehouse.

FLOW DIAGRAM OF KING FEED PLANT

(Copyright, 1959, by Paul Berg)



warehouse. Windows in the old flour mill were bricked up and floors were removed.

Eight 50-ton Butler storage bins were erected outside the old mill building and 36 steel bins were installed inside the building. Facilities were designed and constructed to unload bulk ingredients from either rail cars or trucks at a rate of 40 tons an hour.

From the receiving area, a bucket elevator transfers incoming soft ingredients into the new 50-ton outside bins. Incoming grain, first held in existing bins, is run through a hammermill, and the ground grain is blown up into any of five inside ingredient bins. Soft ingredients initially received in the outside storage facilities are transferred by bucket elevator into smaller 15-ton bins inside the mill building.

The next station in the mill's flow is the 2-ton Toledo batching scale hopper. Major ingredients come from the inside 15-ton bins and micro-ingredients are weighed and dumped into the side of the hopper.

From a Hayes & Stolz 2-ton horizontal mixer, mixed feed is elevated to the pelleting, bagging or bulk delivery systems.

Management chose milling equipment that could produce short runs of one or two tons with a minimum of labor. It was found that complete automation in the batching and mixing system would not be practical, so engineers designed a semi-automated push-button panel board which enables one operator to assemble up to 18 different ingredients in the batching scale hopper. Once the feed has been weighed out of the bins, the rest of the operation is automatic. Ingredients move by screw conveyor from the inside bins to the scale hopper.

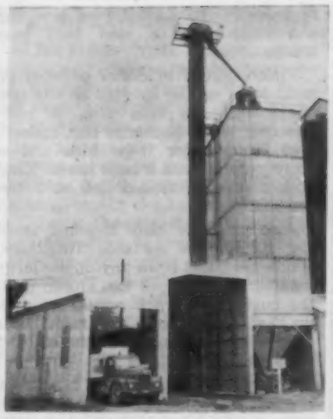
100% Pelleting Capacity

King Milling has manufactured pelleted feeds since 1947. It was in that year that a new batch-type mill was built and the first pellet mill—a 30 h.p. machine—was installed. A second pellet mill was put into use a short time later.

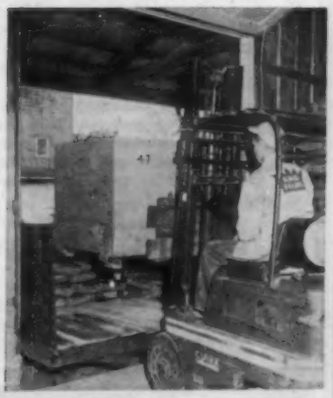
Today, 96% of the feed sold by King is pelleted. The new plan is capable of producing 100% of its capacity in pellet form. King has in operation two California pellet mills, each powered by a 100 h.p. motor and each with a capacity of 12-15 tons an hour.

The arrangement of three 12-ton bulk bins above each pellet mill makes it possible to keep the mills in continuous operation by switching to a full bin when one has been emptied.

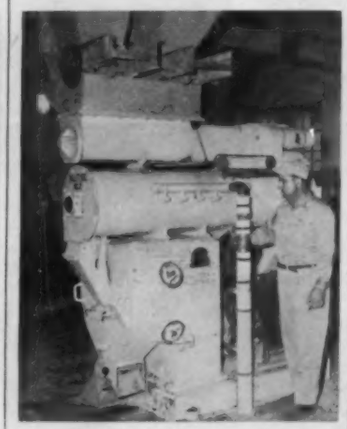
A Wenger horizontal cooler was installed under one mill and a California vertical cooler under the other. King officials say that with this cooling equipment all types of pelleted feed can be manufactured—including



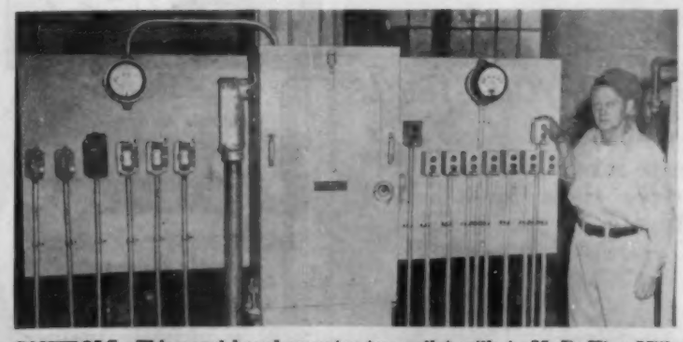
RECEIVING — Bulk ingredients can be unloaded from truck or rail car at a rate of 40 tons an hour. From the receiving area, a bucket elevator transfers incoming soft ingredients into new 50-ton outside bins (right). Incoming grain, first held in existing bins in old mill building (extreme right), is run through hammermill and blown into inside ingredient bins.



FORK LIFT, BIN—Operator lifts 1-ton portable bin into truck with fork lift. These small lifts discharge bulk feed directly into the trucks by raising the outside walls of the bin and allowing the bottom to form a chute. King Milling has 10 of these 1-ton bins for handling small bulk orders.



PELLET MILL—Here is one of two California Century pellet mills installed at King Milling Co. plant at Pittsfield, Ill. The machine is equipped with a wide-faced die and has a capacity of 10-14 tons.



CONTROLS—This panel board operates two pellet mills in M. D. King Milling Co. plant at Pittsfield, Ill. All motors for the entire operation—including elevating leg, shaker, screen, cooler and pelleting motors—are controlled from this point.

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WRITES ORDER — Phil McCleary (left), King feed salesman, writes cattle feed order for Wendell Orr, Griggsville, Ill., cattle feeder. All customers come to this office in the corner of the feed warehouse for orders and pickup tickets.

high molasses pellets and various types of roughage pellets.

Because each of the pellet mills has its own cooler, elevating leg, screening and sifting machines and spouting, each can be operated independently of the other.

Steam for pelleting is generated by a 100 h.p. gas-fired Nebraska boiler. This unit also provides lower pressure steam for heating and for warming of molasses and fat for mixing in certain types of feeds.

Bulk, Bag Facilities

Bulk handling is not new to King Milling. The company's experience with bulk feeds was used to advantage in designing the new mill.

Bagging feeds, too, is an important part of the mill's operation. Two men operate the bagging equipment.

A Richardson automatic bagging scale is set directly beneath four 10-ton finished feed bins. From the bagger, 50-lb. bags of feed are carried on a moving belt through a sewing machine and then are moved down a chute to a bag table. Bags are taken from the table and stacked on 1-ton pallets for warehouse storage. A Clark fork lift truck is used to transfer the sacked feed into the warehouse and to load feed into trucks.

Finished feed in either pelleted or meal form can be spouted to any one of 12 eight-ton bulk bins. A self-cleaning, rapid-discharge belt collects feed from under these bins and a spout empties into a bulk truck. King bulk feeds are loaded out at 1 ton per minute.

Also used for bulk finished feeds are 10 one-ton portable Tote bins, which are filled from any of the large bulk bins in the mill and stored until the customer's truck arrives to pick up the feed. A fork lift truck hauls the bins from storage to the waiting truck for dumping.

Combination bulk-bag Dodgen trucks are operated for delivery of King feeds from the plant directly to the farm. These trucks are equipped to haul seven tons of bulk or bagged feed or a combination of both. They have three 2-ton compartments, making it possible to haul three kinds of bulk feed plus a ton of bagged feed in the same load.

TURNHEAD — The Hayes & Stolz turnhead and spouting connected with unloading leg for handling incoming bulk ingredients are shown here. Spouting goes to each of the eight 50-ton storage bins and into the mill.

The 2-ton horizontal mixer, distribution turnheads and spouting installed for King Milling were supplied by Hayes & Stolz of Ft. Worth, Texas. Four bucket elevators and the 18 screw conveyors for the batching system were fabricated by Union Iron Works, Decatur, Ill.

King manufactures feeds for chicks, layers, broilers, turkeys, pigs and sows, cattle, lambs, rabbits and horses.

Grain Bank, Farm Supplies

Four years ago the Illinois firm established a grain bank program. In addition to 250,000 bu. of storage space, King Milling's grain division has a grain drier and modern unloading facilities.

King's farm supply division, which operates independently of the feed division, serves more than 150 feed stores and elevators in the Illinois-Missouri area surrounding Pittsfield.

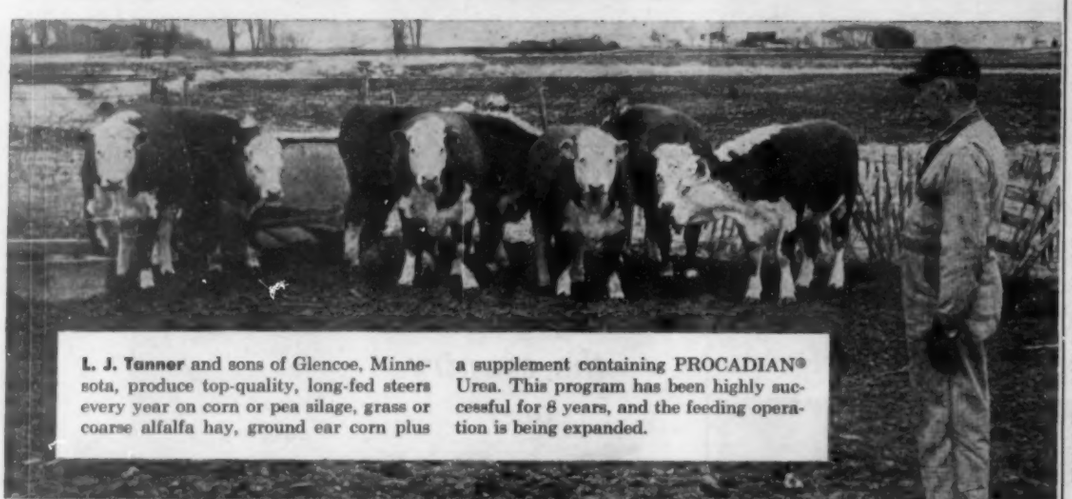
Farm supplies sold by King Milling to its feed customers are classified in three basic categories—poultry and hog equipment, bagged or block mineral and accessory items.

The King feed sales staff has grown from three men in 1954 to eight regular salesmen and one trainee. These men are trained in farm management, breeding, nutrition and marketing.

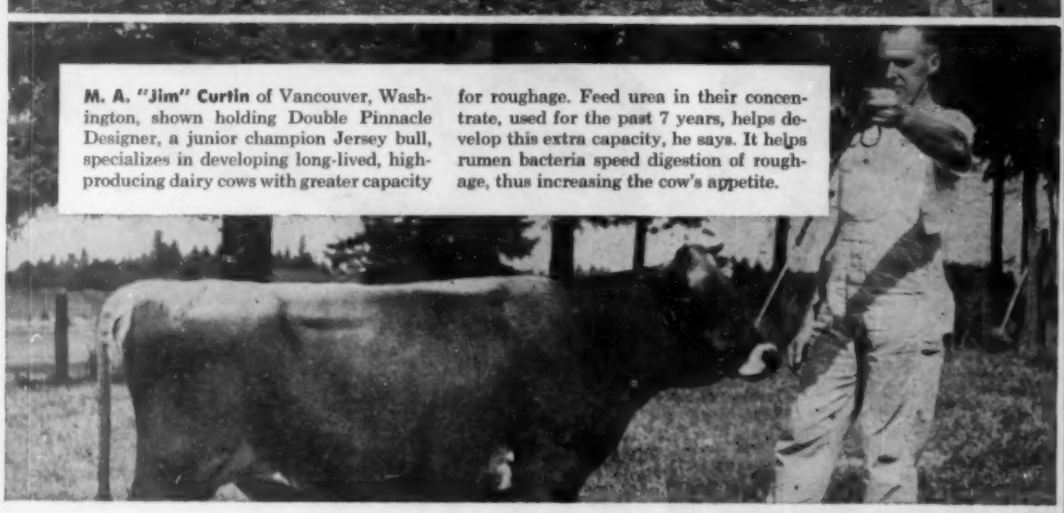
Open House

King Milling opened its new mill in October with an open house celebration. Using the mill's new warehouse as a theater, King sponsored seven hours of entertainment for the public. Tours were conducted through

Long-time beef and dairy operators tell how "feed urea" pays off



L. J. Tanner and sons of Glencoe, Minnesota, produce top-quality, long-fed steers every year on corn or pea silage, grass or coarse alfalfa hay, ground ear corn plus a supplement containing PROCADIAN® Urea. This program has been highly successful for 8 years, and the feeding operation is being expanded.



M. A. "Jim" Curtin of Vancouver, Washington, shown holding Double Pinnacle Designer, a junior champion Jersey bull, specializes in developing long-lived, high-producing dairy cows with greater capacity for roughage. Feed urea in their concentrate, used for the past 7 years, helps develop this extra capacity, he says. It helps rumen bacteria speed digestion of roughage, thus increasing the cow's appetite.

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LABORATORY—Marian Wassell, laboratory technician, runs a fiber test in King feed laboratory. The laboratory is completely equipped to determine protein, fat and fiber content. R. E. Synold is the company's nutritionist.

the new plant and refreshments were served to all visitors.

The history of the M. D. King Milling Co. goes back to 1869 when Clark P. Chapman, who moved to Pittsfield, Ill., from Pittsfield, Mass., built a small flour mill. The firm has been operated since then as a family enterprise.

M. D. King, grandfather of the firm's present members, was a bookkeeper for Mr. Chapman, and after the death of Mr. Chapman, the firm was operated as Dow & King Milling Co. The mill burned in 1899, and in 1900 Grandfather King built what is believed to be the first roller mill type of flour mill in the U.S. The building erected for that mill is the same brick structure in which the present-day M. D. King Milling Co. installed its new feed manufacturing facilities.

The business was incorporated as the M. D. King Milling Co. in 1909 following the death of M. D. King's partner. Mr. King died at the age of 82 in 1931. His eldest son, Lyndle C., became president and held the position until retirement in 1936. Vinton S. King, Jr., served as president until his death in 1941. Present head of the company is M. D. King, II, who joined the company in 1934 following graduation from the University of Illinois. Clark C. King, only son of Lyndle C. King and who has been with the firm since 1926, is treasurer.

As flour milling moved into large terminal mills, the younger members of the King family turned considerable attention to manufacturing commercial feed for livestock.

Limited production of feed was started in 1937. Ten years later new feed mixing equipment was installed —including machinery for making pellets and molasses type feeds.

King Milling has had a nutrition department since 1953. It was expanded in 1957 to include a modern feed testing laboratory. Dick Synold, educated at the University of Illinois and Purdue University, is in charge of feed formulation, nutrition and production.

Wagner Mills Appoints

SCHUYLER, NEB.—Appointment of Roland Langemeier as farm service director for Wagner Mills, Inc., has been announced by John Wagner, president.

Mr. Langemeier has served the last two years as assistant county agent for Colfax County after spending one year in the extension service in Cuming County. Prior to his extension service, he was associated in a farming and feeding operation with his father on their farm near Hooper, Neb.

He was graduated in 1955 from the University of Nebraska College of Agriculture, where he majored in agricultural economics and minored in animal husbandry.

Mr. Langemeier, in working in the newly-created position, also will be associated with the subsidiaries of Wagner Mills, Clarkson (Neb.) Milling & Grain Co., and Dodge (Neb.) Lumber & Grain Co.

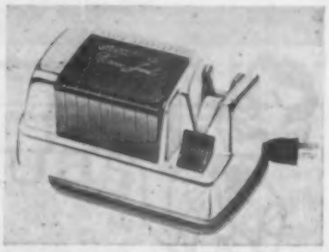
Pfizer Plans Animal Health Promotion

NEW YORK—A spring promotion of animal health products, featuring a "Dixie Special" and a premium for consumers, has been announced by Chas. Pfizer & Co., Inc.

In the South Pfizer is offering dealers a "weather display" for its animal health line that features a "weather eye" for immediate predictions on "rain or shine." The "Dixie Special" package line will include seven animal health products for use in fighting diseases and stresses in broilers, layers, cattle, hogs and sheep.

Nationally, a minimum order of the firm's products will qualify any retailer for a customer contest premium—an electric knife sharpener.

"As part of a special Terramycin Egg Formula promotion," the company said, "egg producers will have a chance to cash in on product certificates. For every coupon turned in to Pfizer by a flock owner purchasing Egg Formula, a redeemable certificate for a free package of the product will be made available. The offer for turning in coupons to the drug and chemical firm will expire April 1."



CONSUMER PREMIUM—An electric knife sharpener will be used by animal health products dealers as a prize for customers in a Pfizer spring promotion.

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EUREKA TWIN SHOE SUPER CLEANER doubles your capacity in the same floor space. Over 40 sizes in Twin Shoe or in 3 & 4 screen, 2 air Standard and Special models. Capacities to suit every requirement. Standard or All-Steel Construction.

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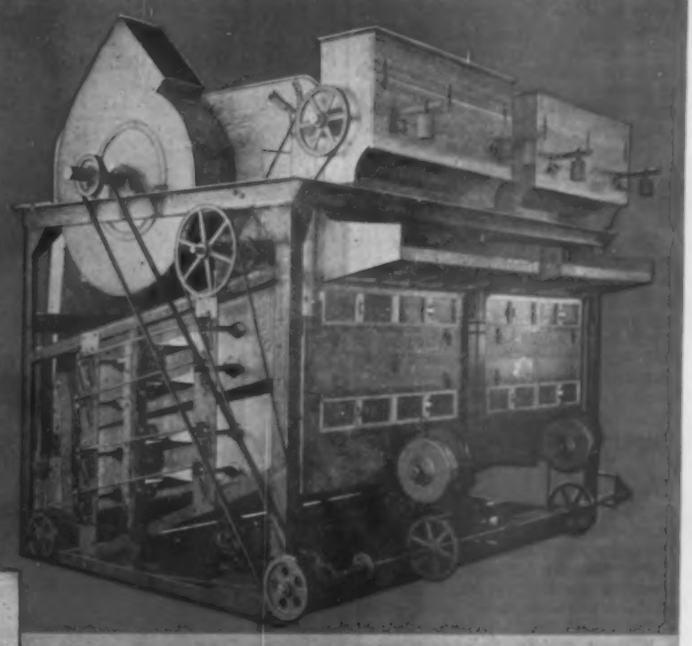

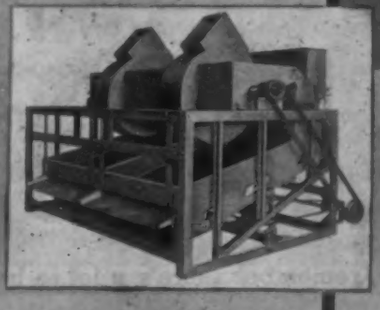

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Since 1856 only one grade of equipment...the FINEST!

There's more information for you on Eureka cleaning equipment. Use this handy coupon—or write, wire or phone, if you prefer. You'll get prompt, personal attention to any request.

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IDEAS TO HELP YOUR CUSTOMERS

Feeding Slaughter Calves

Recent trials at the University of Florida beef research unit provide information on possible ways to cope with the price slump in slaughter calves.

Three different programs have proven profitable in university trials:

● One system involves placing the calves on full feed in dry lot for about 200 days and marketing them as baby beef. This has resulted in a return of 4¢ more per pound at weaning than the calves would have brought on the auction market.

"For this system to be satisfactory," says Dr. Marvin Koger, animal husbandman, "calves should weigh 450 lb. or more at the beginning of the feeding period. Calves should be fed a high energy ration for 200 days. Feed only the older, heavier calves. Calves which are light or young at weaning should be marketed in some other manner."

● The second system involves grazing steers on good pasture for a year following weaning and selling them as feeders or grass-fat cattle. Steers were wintered in tests to gain an average of about ¼ lb. per day and then grazed on good clover-grass pasture. These steers gained an average of slightly more than 300 lb. per year. They were worth an average of 16¢ lb. at the end of the grazing season.

This was slightly more return from pasture than could have been obtained with cows and calves.

● The third additional net return was realized by drylot feeding yearling steers for a period of approximately 100 days, rather than selling them directly off pasture.

◆

Supplement Saves Money

Feeding hogs a straight corn diet won't save the producer any money. In fact, eliminating protein supplement will boost the total feed bill for getting pigs to market weight.

Prof. Robert E. Jacobs, extension livestock specialist at the University of Minnesota, explains why, giving reasons feed men also can use.

Without protein, he says, it takes more than twice as much corn to put on 100 lb. of gain. The extra corn more than offsets the protein cost.

A few years ago, university researchers compared a protein-supplemented ration with a diet of corn and minerals only. They started with pigs averaging 50 lb.

Figuring present day prices, it would have cost about $25 to produce a 200-lb. market hog on the supplemented ration, and about $33 using the unsupplemented diet. That's an $8 advantage in favor of using supplemental protein. Prof. Jacobs figured corn at $1 per bushel and minerals and supplement at $5 per 100 lb.

Pigs on the supplemented ration in the university trials ate 5.2 bu. of corn and 52 lb. of protein feed to produce 100 lb. of gain. Hogs fed corn and mineral only ate 12.1 bu. of corn and 21 lb. of mineral. As a result, feed cost for 100 lb. of gain was $7.80 on the supplemented rations and $13.15 for the ration without extra protein.

Other costs should be added, too, Prof. Jacobs says. First are charges for labor, veterinary expenses, taxes and equipment. These are about $2.85 per 100 lb. of pork produced. Second are charges for sow feed from the time the sow is bred until she weans her pigs. These would be about $4 per pig for a sow raising seven pigs per litter. Third, each pig would eat about $4 worth of creep feed up until he reaches 50 lb. in weight.

Adding all these figures up, Prof. Jacobs says a 200-lb. hog on the supplemented ration would have required $8 up to 50 lb. weight for sow feed and creep feed; $5.70 for labor and other miscellaneous costs and $11.70 for feed for the last 150

Illinois manager reports on SHANZER grain drier

"My new Shanzer drier helped me to the best year I've ever had. We had heard from other operators about Shanzer's exceptional performance and safety reputation, but it takes day after day experience to see how much difference in d[illegible]ere really is.

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You can sell best

...and customer satisfaction "comes in Burlap!"

Have you ever added up the inducements you can offer when you sell sacked feed in burlap? They can help you in selling. Here they are:

1. *A discount* on every ton of feed, when the mill provides a return-bag program.
2. *Simplified inventory* for the customer.
3. *Identification* for medicated feeds.
4. *Non-separation* of formula-ingredients.
5. *Your prices* are competitive with returnable burlap bags.
6. *Service*...you can give small customers as good delivery service as large customers (and on the same route).
7. *Bulk customers* can be served with bag-to-bulk trucks.
8. *Quantities* can be bought *as needed.*
9. Feed in burlap bags is *sanitary and free from contamination.*
10. *Accurate weights* are assured in a burlap bag.
11. *Fifty-pound* as well as 100-lb. bags can be offered.
12. Farmers have many uses for empty bags...only burlap serves them so well!

Quite a few selling-points, don't you agree? Next time you're selling a new customer, remember there's a lot to be said for burlap bags!

Just ask your own customers—they'll tell you that burlap

Is strong — takes dragging, dropping, *man-handling* — any tough job on the farm.

Laughs at sudden showers — wetness or dampness can't weaken it.

Saves money — extra value from re-sale and re-use.

Gives good ventilation — keeps farm supplies and products fresh.

Saves storage space — stacks to any height without slipping.

Has 1000 uses — always in demand on the farm (popular with farm wives, too!)

pounds of gain. The total would be $25.40.

Cost of producing a 200-lb. hog on the unsupplemented ration would be $33.42. All costs would be the same as for the supplemented ration, except for feed from 50 lb. on.

◆

Cost of Producing Eggs

Low market prices in 1959 for eggs have brought to the attention of Florida egg producers the importance of knowing the cost of producing a dozen eggs.

J. S. Moore, poultryman with the Florida Agricultural Extension Service, says the margin between cost of production and selling price was much closer in 1959 than in some other years and may continue to be closer in the future.

Four main cost items must be considered in producing market eggs:

● Feed will generally account for more than 50% of the total cost. Mr. Moore noted that it is difficult to arrive at an average price for feed. Some producers use bulk and others mix their own. To figure feed cost per dozen eggs, it is necessary to take actual feed costs.

● Recent figures on the cost of growing out good pullets show the actual cost, excluding chick cost, was $1.30. When chick cost is added, the total cost will amount to about $1.80, Mr. Moore notes. Ready-to-lay pullets are selling for $2@2.25 each.

When figuring the cost to produce a dozen eggs, the matter of depreciation on the bird must be considered. The cost can run from a high of 12.5¢ doz. for the pullet that produces only 144 eggs to a cost of 6¢ for the pullet that produces 300 eggs. In the case of the 240-egg pullet, which Mr. Moore says should be the goal of poultrymen, the cost is 7.5¢.

● Labor cost can vary according to the number of birds in the flock and their rate of production. Labor cost figures per dozen eggs may vary from a low of 1.8¢ to a high of 2.6¢. Mr. Moore says the commercial egg producer must keep accurate records on labor costs to arrive at correct figures.

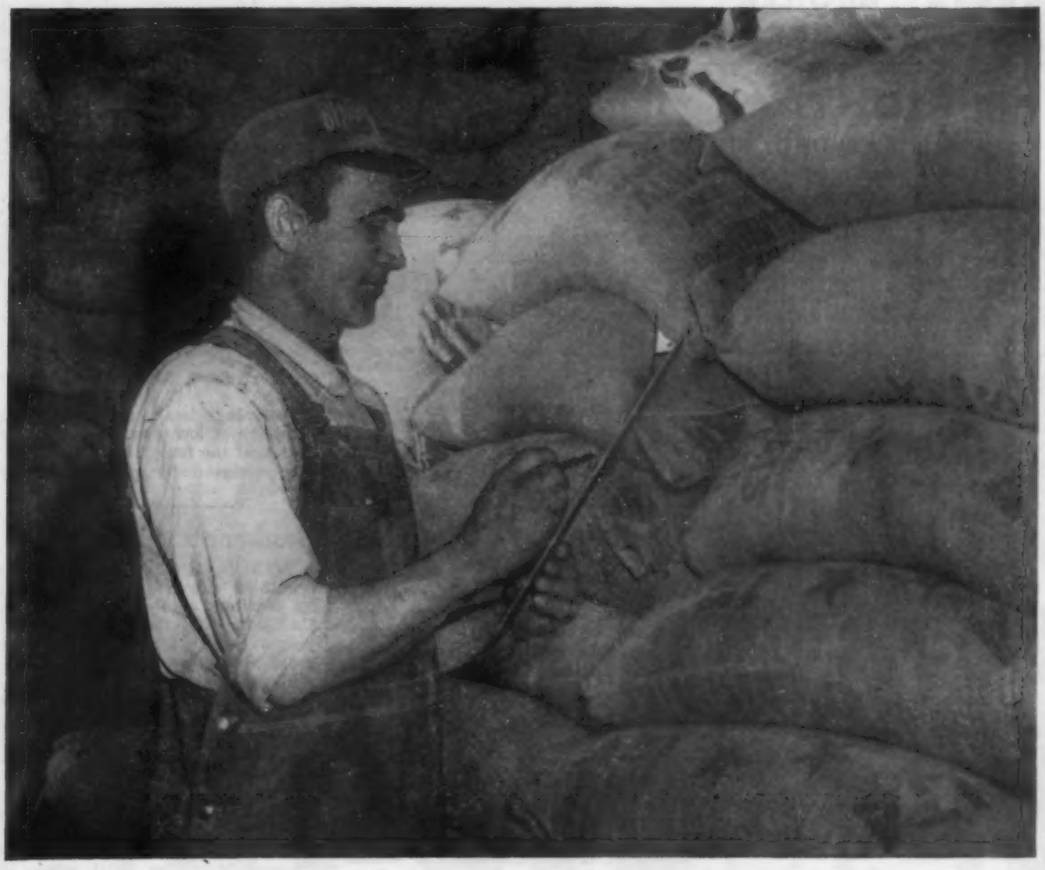
● Items such as utility taxes, insurance, depreciation on buildings and equipment, interest on investment, egg cartons and truck cost will vary from farm to farm. Records of several Florida egg producers indicate the miscellaneous cost per dozen eggs is about 7¢.

Total costs for all items amount to about 32.5¢ doz. eggs. Mr. Moore says these may be conservative figures, and he urges every producer to keep his own records and analyze them to figure methods of reducing production costs.

BULK FEED MILL

LAMONI, IOWA — Farmers Coop Grain & Seed Co. held open house at its new bulk feed mill here recently.

what serves best!



THE
BURLAP COUNCIL
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Letters to the Editor

Farm Prices

Nacogdoches, Texas

To the Editor:

(The following letter was sent to the Texas congressional delegation and the House Agriculture Committee.)

"With eggs selling on the farm for 25¢ doz., broiler chickens selling for 15¢ lb., milk selling for 10¢ qt., hogs selling for 12¢ lb. on foot and the cattle market declining, I don't see how Congress can justify increasing the minimum wage.

"How long can our industrial economy inflate while our agricultural economy deflates? The U.S. Department of Agriculture says the farmer's share of the food dollar is only 38¢—the lowest in 20 years.

"The only part of our agricultural economy that is stable is the 20 odd commodities supported by government price props. These crops are produced by a very small percentage of our total farm population.

"Many farmers are working for 50¢ per hour or less. How can they buy the products of industry with a continued inflationary price structure?

"Was Mr. Nixon's forced settlement of the steel strike a victory?"

Steele Wright, President
Texas Farm Products Co.
Nacogdoches, Texas

California Conference Committee Is Named

SACRAMENTO, CAL.—Bert Maxwell, Nulaid Farmers, Inc., Petaluma, has been appointed chairman of the 1960 Animal Industry Conference committee of the California Hay, Grain & Feed Dealers Assn.

Other members of the committee appointed by Arthur H. DeRaad, vice president, include: Dr. H. S. Wilgus, Ray Ewing Co., Pasadena; Dr. H. J. Almquist, Grange Co., Modesto, and Bob Caldwell, Andersen-Smith Mfg. Co., San Francisco.

University of California representatives on the committee will include: Dr. J. H. Meyer, animal husbandry; Dr. C. R. Grau, poultry husbandry, and Dr. D. E. Jasper, veterinary science.

GRAIN FIRM INCORPORATED

JEFFERSON, S.D. — Michaud Grain Co., with branch offices at Sioux Falls, has filed articles of incorporation, listing $25,000 capitalization and these directors: Frank, Herbert and Roy Michaud, all of Jefferson.

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Guaranteed to give almost 2 times growth response due to "unidentified growth factors" . . . compared to pressed meal
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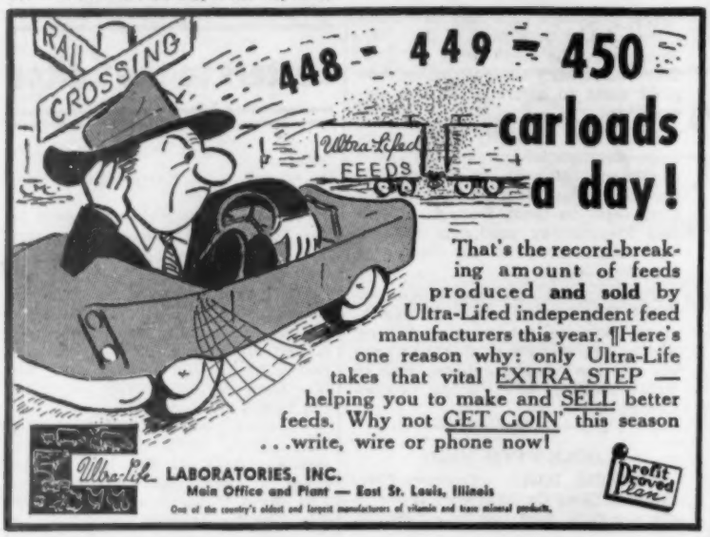

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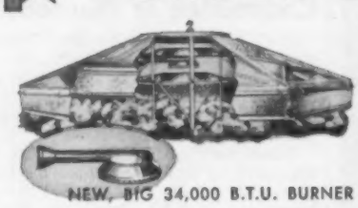

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with the NEW "COMFORT SPOT" No. 1686 Automatic Gas Brooder

- NEW, BIG 34,000 B.T.U. BURNER — Produces greater range of heat coverage — no flash backs.
- NEW, SIMPLE SNAP-ON 84" CANOPY — 6 sections easily snap in place — held permanently by only 12 bolts. (Available with or without aprons.)

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Automatic Mechanical Feeder ... NOW does TWICE as much WORK for YOU!

- Delivers 500 lbs. of FULL FORMULA feed per hour.
- Services 2 lines totaling 1200 feet of linkage.
- Feeds up to 15,000 broilers.
- Automatically fills ALL Types of hanging feeders.
- New "deep trough" saves more feed on floor installations.

3★ WATER 'EM RIGHT!

with the New "FLO-MATIC" Automatic Overhead Waterer

The continuous automatic adjustable overhead waterer that stops stooping to adjust trough legs. Winch raises or lowers trough to any desired height for house cleaning. Solenoid valve assures care-free, always-fresh water distribution.

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SELLIN' SAM — By Jim Zilverberg

"You're always so engrossed in that morning paper that I wonder if you ever really know what I serve you for breakfast!"

Iowa Swine Meeting Scheduled Feb. 25; Plans Announced

AMES, IOWA — Iowa swine producers will hold their annual conference at Ames Feb. 25, William Zmolek, animal husbandman, said at Iowa State University. More than 1,000 swine producers often attend this event.

Mr. Zmolek said the morning session will deal with swine industry problems and the afternoon will be devoted to production.

Dr. Damon Catron, in charge of swine nutrition research at the university, will report in the morning on problems of swine production. Augie Ring, of the American Meat Institute at Chicago, will discuss pork consumer relation problems. Patrick Luby, of Oscar Mayer meat packers, Milwaukee, will discuss the cost of pork from farm to consumer. Wallace Ogg, farm economist, will talk on Iowa State University's program for agricultural adjustment.

A Minnesota agricultural engineer who has had extensive experience with remodeling old barns, Dennis Ryan, will tell how to remodel old structures for modern hog raising.

Dr. Thamon Hazen, Iowa State University agricultural engineer, will report on how much housing may be needed for growing and finishing hogs. Dr. Maynard Spear, veterinarian, will discuss "Disease Free Pigs." Dr. H. L. Self, University of Wisconsin, and Vaughn Speer, Iowa State, will hold a joint discussion in the area of nutrition and management as these factors affect reproduction efficiency in swine.

Automatic Dry Cleaner For Eggs Described

NEW YORK — An automatic dry cleaner for eggs that can sort, clean and pack 240 eggs in 11 minutes has been produced in Britain, according to the British Information Services, New York.

The cleaner, put out by Martin Watson, Thornhill Ltd. of Derbyshire, England, stands 3 ft. high, 2 ft. long and 18 in. wide. The eggs that are fed in at the top, are held against a fast rotating mop treated with a compound. The speed of the mop is timed to give the right temperature when in contact with the egg.

The British Information Services also announced that a firm in England, George H. Elt Ltd. (Worcester), has come up with an adjustable drinking trough suitable for any size of poultry from day-old chicks to table birds.

The water is supplied through a valve, which is automatically controlled by the weight of the water in the trough, and fitted with a removable cap-and-liner type coupling suitable for rubber, plastic or Alkathene tubing.

The trough is also suitable for use with high or low pressure water supplies, and the trough itself is removable, designed for quick and easy cleaning.

Bankruptcy Petition

MILTON, DEL. — A petition has been filed here in U.S. District Court by creditors of the Milton Poultry Co. asking that the company be adjudged bankrupt and that any disposal of its assets be halted.

Those seeking the bankrupt status for the Milton firm, all claiming debts in payment for poultry given to the Milton firm for processing, are: John S. Isaacs & Sons Farms, Inc., Ellendale, claiming $36,572.62; Stanley Thompson, Irving D. Burton and Sue C. Burton, trading as Irving D. Burton with offices at Lewes, claiming $46,596.95, and Red Comb Pioneer Mills, Inc., with offices at Selbyville, claiming $39,840.31.

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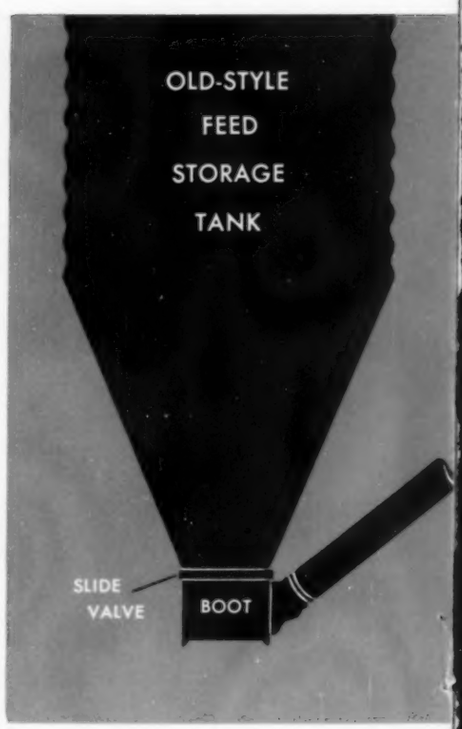


In old-fashioned bulk feed tanks the boot creates a problem. Feed flow is restricted, which causes bridging in the hopper. And with the slide valve located above the boot, clean-out is difficult; it's almost impossible to avoid having feed accumulate in the boot below the auger. This old-style design also permits possibility of water seepage around the slide valve.

-IMPROVED FEED
—HANDLING EASE

NEW *Live-Bottom-Action**

Butler Bulk-O-Matic tanks

**Available in both center and side draw-off models*

In new Bulk-O-Matic tanks the auger is located in the hopper itself. The action of the auger creates a live condition which keeps feed active and free-flowing. This minimizes bridging. Note, too, how slide valve is located below auger—greatly simplifying clean-out. And, with auger recessed into hopper there is no place for water to accumulate—seepage is eliminated.

Exclusive with Butler at no extra cost! Here's the newest in bulk feed storage and handling. The new Butler 1960 line of Bulk-O-Matic tanks, the only bulk tanks with hoppers specially designed to handle 1960 feeds.

This new Live-Bottom-Action hopper (see details at left) is a major improvement in bulk tank design. Available in both Butler standard and new Butler smooth wall tanks, this hopper offers many advantages.

Flow characteristics of high-fat feeds are improved. There is no boot . . . no place for water to seep in and cause mold. Clean-out is fast, easy and complete. Contamination problems are minimized.

This new 1960 line of Butler bulk tanks can help merchandisers of feed products two ways. First, these tanks offer improved feed handling and safer storage at no increase in price. This superior line of tanks gives you a competitive edge with your important bulk feed customers.

Secondly, these new tanks can effect substantial savings for the feed merchandiser planning bulk feed facilities of his own. Remote-controlled load-out stations can be erected, operated more economically. The new Live-Bottom-Action hopper requires smaller motors that cost less to buy, install and operate.

Get the full story on the new 1960 line of Butler Bulk-O-Matic tanks—the only tanks with Live-Bottom-Action hoppers. Contact your feed manufacturer or write direct.

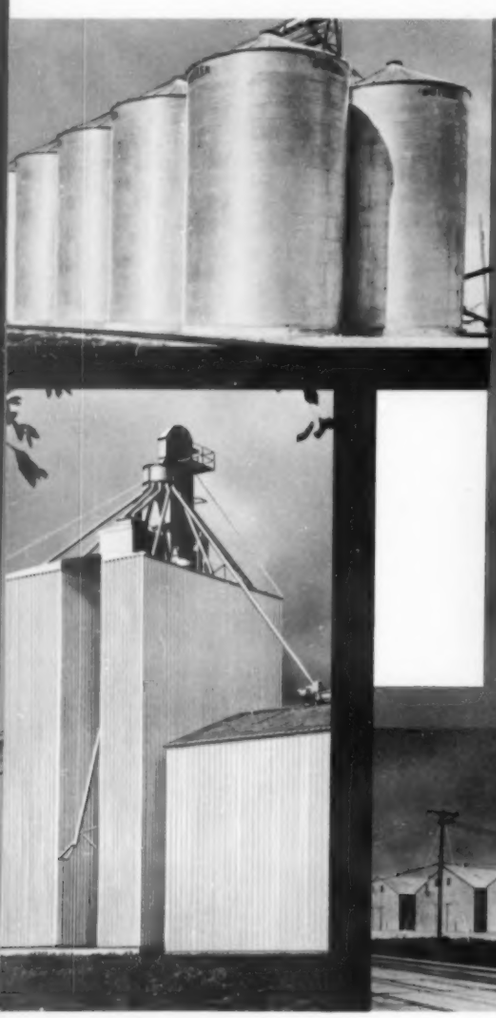
Butler Bulk-O-Matic Tanks

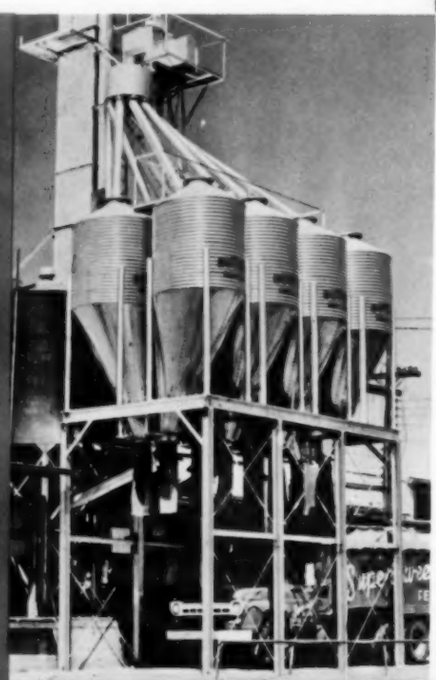
now offered with smooth walls too!

Here's a bulk feed tank that offers the smooth wall construction of costly welded tanks, but at a far lower price.

It's the all-new Butler 1960 smooth wall Bulk-O-Matic tank designed specially for handling medicated and other types of feeds where thorough clean-out is essential.

This new smooth wall Bulk-O-Matic tank with Live-Bottom-Action hopper enables feed merchandisers to offer poultry raisers and others a premium quality tank at an unusually low price. A complete line of smooth wall Butler Bulk-O-Matic tanks is available in capacities from 2 to 10 tons.





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Milo Range Helps Cut Turkey Costs In Missouri Tests

COLUMBIA, MO. — Milo range helped reduce costs of producing turkeys in tests at the University of Missouri.

Results of tests on value of milo for turkey range were reported at the Turkey Day program here at the University of Missouri. Dr. H. V. Biellier of the university poultry department made the report.

"Big advantage of milo as range is that it provides both forage and grain for the turkeys," according to Dr. Biellier. "Grass and legume ranges provide lots of forage but it's generally high in moisture and low in protein and energy. Milo provides a grain which is comparable to corn in feeding value. It supplies the high energy feed needed by turkeys near the end of their growing and finishing stages."

Although milo grain is low in vitamin A, Dr. Biellier said, the milo forage will supply some of the vitamin A and the additional needs can be supplied in the concentrate.

Turkeys have little trouble harvesting the standing milo heads unless the milo has grown unusually tall, he noted.

In university tests, good results were obtained with turkeys on milo range from 12-24 weeks of age. In one test where toms and hens were separated on milo range, total cash feed costs, including cost of seeding milo, were $2.49 per male bird compared to $2.94 for birds full-fed in confinement. For females, the milo range cut total feed costs 21¢ per bird. The birds on range received a growing mash supplement.

In another test with toms and hens ranged on milo together, average feed cost per pound of gain to market weights was 10.4¢. These birds received a 36% protein supplement in pellet form. Pellets were fed on the ground, a practice which worked well, except in rainy weather, Dr. Biellier said.

"Turkeys to be grown on milo range should be started about June 1," Dr. Biellier said. "The milo should be planted about the same time. It should be ready for range about the middle of August."

The poultry researcher said it's probably best to take the birds off range after the first frost. Any grain still standing can be combined.

Dr. Biellier recommended using 3-5 lb. of certified milo seed per acre. An acre of milo will provide range for 1,000 birds for about one week. Some grass or legume sod strips nearby aid in movement of feeders and shelters during rainy weather.

Turkey outlook for 1960 was presented at the Turkey Day meeting by C. B. Ratchford, director, Missouri Agricultural Extension Service. He said "strong prices in late November and December have resulted in a general feeling of optimism that will likely result in increased production next year. A shift to heavier birds is indicated, probably as a result of this past year's relatively high prices for heavy toms."

"Prices for 1960 will be about the same as last year, even if production is greater," Dr. Ratchford said. Holding the prices steady will be a larger domestic demand, possible increase in exports and small cold storage holdings at the end of 1959.

The turkey industry has an optimistic future in Missouri, said Dr. Elmer Kiehl, chairman of agricultural economics. Dr. Kiehl pointed out that Missouri "has the necessary ingredients to expand turkey production. These ingredients are climate, location and market opportunities."

Profit margins on turkeys will likely continue to be low, said D. D. Moyer, turkey specialist with the A. E. Staley Manufacturing Co., Decatur, Ill.

That means future profits will be made on high volume operations that are very efficient production-wise, Mr. Moyer said. He noted that real efficiency calls for a careful analysis of the entire production program.

Management is the principal area in which efficiency can be improved, he said. Mr. Moyer pointed out that, on the national average, about 11% of the poults that are started never reach market age. It takes the profit on approximately six turkeys that are marketed to make up the out-of-pocket loss on one poult that dies at 20 weeks of age, Mr. Moyer said.

Bulk Volkswagen

OSKALOOSA, IOWA — A 16-ft. Pamco "Bulk-Bag Back-Saver" conversion unit, to be mounted on a Volkswagen truck, has been sold by Productive Acres Manufacturing Co. to Ludwig Kathmann, Calvesiage, Germany. Pamco, Inc., manufactures hydraulic-driven bulk feed handling equipment.

DEMONSTRATED COST SAVINGS

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Scientific Judgment in Law and Regulation

A Scientist Tells Why He Thinks a Change in the Wording of the Delaney Clause Is Needed Now.

By Dr. Edward J. Matson
Abbott Laboratories

Just 16 months ago Congress placed on the statute books a new federal food additive law. Congress considered it necessary because of the greatly increased speed of development of food technology. The law reversed the whole pattern of enforcement by requiring in effect that a general license be granted by the enforcement agency prior to putting into use any new additive developed through food research. This new responsibility demands of the Food & Drug Administration administrative judgment of a different order than before. If sound policy is not developed and followed consistently, business and the public both can suffer needlessly. Certain events of the last year have disturbed many, events which indicate an uncertain administrative striving for the soundest scientific judgment.

Business Responsibility—Let me say clearly that I would not oppose the imposition on the food industry of any law soundly conceived and necessary for the protection of public health. Several generations ago it began to be understood that business cannot be a law unto itself, but will prosper only as it responds to public need.

What Is Scientific Judgment?—I used the term "scientific judgment." What does the term mean?

It is the concept that **reasonableness as applied to belief may properly be related to reasonableness in acting upon the belief.** In other words, when enough data are obtained to support taking an action which has desirable practical consequences, it is foolish to delay action for more stringent evidence. A regulatory agency, therefore, uses "scientific judgment" in deciding that the probability of safety of an additive used within a certain tolerance limit warrants issuing the tolerance.

Two Purposes for the Food Additive Law—The Food Additive Amendment to the Federal Food, Drug and Cosmetic Act was passed with two purposes in mind, according to the report[1] of the committee on Interstate and Foreign Commerce of the House of Representatives:

"(1) To protect the health of consumers by requiring manufacturers of food additives and food processors to pretest any potentially unsafe substances which are to be added to food; and (2) to advance food technology by permitting the use of food additives at safe levels."

The first purpose is self-evidently desirable. There was unanimous support from both business and the public for a new law which would set forth clearly that the safety of a new food additive must be scientifically established before it is used.

There is some tendency to forget the second purpose of the new law—that food technology is to be advanced by permitting new substances to be used in foods at safe levels. This is no idle purpose. It is essential to our national future. Look at the manner of living of the American people as we enter 1960. Few of us produce our own food. Most of us are city people far from the place where food is produced. We seem intent on increasing the birth rate. We have allowed our wives to learn to rush into the market at the last minute to pick up a supply of pushbutton meals which they can serve on time, even though they are late because their committee meeting ran overtime.

Deputy Commissioner Harvey of FDA has been quoted as saying: ". . . It would be, perhaps, utterly impossible to feed the country without food additives unless we moved our homes out of the congested centers." He is right. As we face the population explosion of American cities we see that there is no choice but to process food so that it may be transported long distances and stored for extended periods of time and still retain its nutritious value and its acceptability when it is purchased and used by the consumer.

Political and Scientific Pressure—The enforcement of the food additive law so as to best comply with both purposes—safety for the user and the advancement of food technology—requires judgment of the highest caliber in the regulatory agency. And it can be nothing but the best scientific judgment. A great danger to the exercise of sound judgment occurs when there is pressure to repudiate the second aim of the food additive law—that is, to enforce the law in such a way that food technology actually no longer advances.

This influence may be applied politically, or it may come from within the scientific community itself.

The science of pharmacology performs on the basic assumption that research over a reasonably short period of time, combined with insight as to the probable significance of the results, will permit the acceptance of food additives as safe for human beings with substantially no hazard involved. This is the essence of scientific judgment. Against that one contrasts the empirical method, whereby one gets results only by long trial-and-error, taking no opportunity to recognize clues which will lead to the best answer in a shorter period of time.

The new food additive law permits the first approach, whereby it is believed that a food chemical may be cleared as safe by competent pharmacologic methods within a reasonable time. The proponents of "natural" foods seem to assume that naturally occurring chemical compounds are inherently harmless, or at least that they have been found by trial-and-error over hundreds and thousands of years to be safe for use. Frazer[2] has commented well on this matter:

"The addition of either natural or synthetic chemicals to food carries a potential risk to the consumer if the pharmacological action of the substance in this dietary context is not known. Synthetic chemicals are no more likely to be toxic than natural substances—indeed, many of the most potent poisons known are of natural origin. Substances that have been consumed as food for centuries are not necessarily harmless, since millions of people have died from unknown causes over the same period. . . . Thus, many natural constituents of the diet may have harmful potentialities. The diet must be regarded as a part of the environment of man, and one of the factors that may determine the life-span of the individual. The problems of chemicals in food fall into their proper perspective when examined against this broader background."

For my part, then, I prefer to base my chances for survival on the pharmacologic method.

The views of those who wish to accept as safe only those chemicals of "natural" foods are fundamentally a repudiation of the science of pharmacology, and therefore a repudiation of the scientific method generally. In the food additive field, this means a repudiation of scientific judgment. It would be far better if a regulatory agency in this field were not subjected to pressure of this type, of either scientific or political origin.

Meaning of the Delaney Clause—Undoubtedly no section of the food additive law has been more disturbing than the so-called Delaney clause, Section 409 (c) (3) (A). This clause was added just prior to the passage of the Food Additive Amendment, and operates to limit the discretion of the Food & Drug Administration in acting upon a petition for a food additive. It reads:

"Provided, that no additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are appropriate for the evaluation of the safety of food additives, to induce cancer in man or animal. . . ."

When the bill was enacted it was

1. House Rep. No. 2284, 85th Congress, 2nd Session, July 28, 1958.

2. Fraser, A. C., Problems arising from the use of chemical in foods. Pharmacological aspects. Chem. and Ind., No. 21:466 (May 24, 1952).

The Author's Point of View

Dr. Matson, who made the statements presented in this article in a talk before the section on pharmacy of the American Association for the Advancement of Science, offers frank opinions regarding the importance of making room for scientific judgment in enforcement of the Food Additive Amendment of the Food, Drug and Cosmetic Act. This article consists of excerpts from Dr. Matson's talk. The author, director of scientific administration, Abbott Laboratories, North Chicago, Ill., believes:

- "A great danger to the exercise of sound judgment occurs when there is pressure to enforce the food additive law in such a way that food technology actually no longer advances . . . It would be far better if a regulatory agency in this field were not subjected to pressure of either scientific or political origin."
- "An enforcement agency cannot allow itself to adopt a regulatory policy which requires the proof of a negative before approval under the law can be given."
- "There is one change in the Delaney clause which can and should be made now to provide an opportunity to restore scientific judgment to its interpretation."
- "We should write our laws and set regulatory policy under them so that we will find and eliminate the real hazards."

not generally suspected that this language might be construed in such a way as to limit scientific judgment. In fact, the Food & Drug Administration expressed the view that the Food Additive Amendment meant the same with or without the Delaney clause. However, subsequent events have shown that the federal agency has interpreted the law beyond what it appears to mean.

The Delaney clause has in it what lawyers call a per se concept. You will recall that the first part said that no additive can be used in foods "if it is found to induce cancer when ingested by man or animal. . . ." This language leaves no room for scientific judgment in that it bars absolutely a substance that has caused cancer when taken orally by man or animal, regardless of the amount required to cause the effect or the length of time necessary to cause it.

I believe experience has shown us that no per se law is a good one. No law can so completely spell out how a scientific matter should be regulated that judgment should be completely excluded. For that reason the Delaney clause is a bad law.

Negative Interpretation of the Delaney Clause — Nevertheless it is a law with which we could probably live, because none of us wants cancer anyway, if it were properly interpreted by the Food & Drug Administration. The phrase "is found to induce cancer when ingested" looks quite straightforward. The words "is found" plainly mean that enough data exist to establish reliably that a substance has really caused cancer in man or animal. Our knowledge of cancer is still so limited that any other basis for calling a substance a cancer-producing agent leaves the scientist deep in confusion.

Imagine the consternation produced by the FDA in its first action under the Delaney clause when it announced that no additional approvals would, for the present, be given to animal feeds incorporating any arsenic-containing compounds. This was a strange beginning to the enforcement of the Delaney clause, as it set a precedent whereby an entire class of chemical products, known and unknown, was prejudged and condemned, including some organic arsenical drugs which are generally recognized as safe under the conditions of intended use.

Fortunately, FDA later amended its views by conceding that it has not been demonstrated that all arsenic compounds are carcinogenic. It was contended only that certain inorganic arsenicals have been found to induce cancer in man.

It is not the purpose here to evaluate the evidence on which inorganic arsenic is considered to be carcinogenic. Some scientists who have studied the evidence feel that it is much too sketchy to be valid for man, and there is no good evidence whatever that it has been possible to produce cancer in experimental animals. Attention is called rather to the surprising position next taken by FDA. Additional approvals for organic arsenical drugs are to be denied because "there remains a relevant, scientific question whether such substances may cause cancer . . . our scientific advisers cannot say that arsenic compounds used in feed . . . are safe until it is demonstrated that such compounds do not have this carcinogenic potential. . . ."

Now, this is a far cry from the language of the Delaney clause. It is difficult enough to apply reasonably a law which leaves no room for scientific judgment, except for the judgment whether data are sufficient to establish a substance as a carcinogen. Scientifically it is an entirely different matter to be asked to establish that a substance is **not** a carcinogen. Imagine what the problem would involve, if you were asked to prove it.

Two Heads, No Tails

Let's look at what is involved in proving a negative proposition. Suppose you have a two-headed coin in your pocket and I have the assignment of proving it although I may not see the coin. In other words, I must establish that the coin does **not** have "tails." I would ask you to flip the coin. If it came up "heads" five times in a row, I wouldn't think too much of it. If it came up "heads" 10 times straight, I would begin to be suspicious. If it came up "heads" 20 times in a row, I would feel it quite probable, and practically proved, that your coin did not have "tails" on it, but that you had tinkered illegally with money and had one with two "heads."

That little experiment of proving the negative might take three minutes. Just how long can you imagine it would take a pharmacologist to prove with an equal degree of certainty that a certain chemical substance does not cause cancer?

One can only think that this unfortunate interpretation of the Delaney clause is a consequence of the kind of political and scientific pressure I mentioned earlier. But it is my firm opinion that an enforcement agency cannot allow itself to adopt a regulatory policy which requires the proof of a negative before approval under the law can be given. Granted that cancer is an important disease, granted that we all have a strong emotional reaction toward it, still we cannot really help meet the problem of cancer by the scientifically impossible requirement that any food additive be proved not to cause cancer before it can be used.

Modification of Delaney Clause Needed—It is clear that the Delaney clause implies and has been read to mean more than is scientifically possible to accomplish. If there is a feeling that the Delaney clause serves any purpose at all, I believe it must at least be modified promptly to restore perspective.

There is no difficulty from an enforcement standpoint in the exclusion from our food supply of a "strong carcinogen." No one has ever proposed that a tolerance be set for 3,4-benzpyrene, although it might be quite possible when we some day understand how the cancer process is initiated.

The difficulty comes with what we call "weak carcinogens." Just what we mean by the term, I am not sure we know. However, it does cover

(Turn to page 48)

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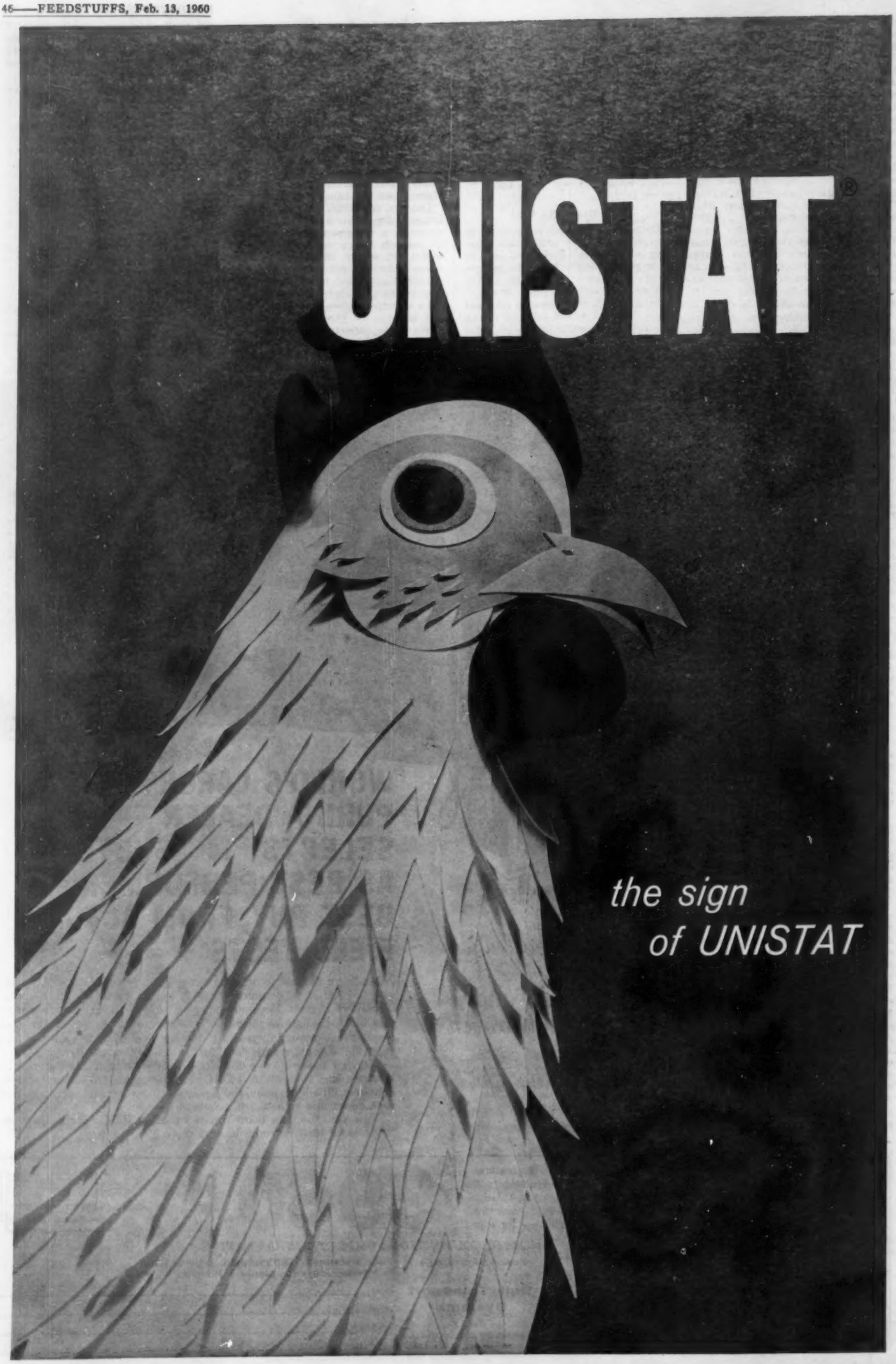
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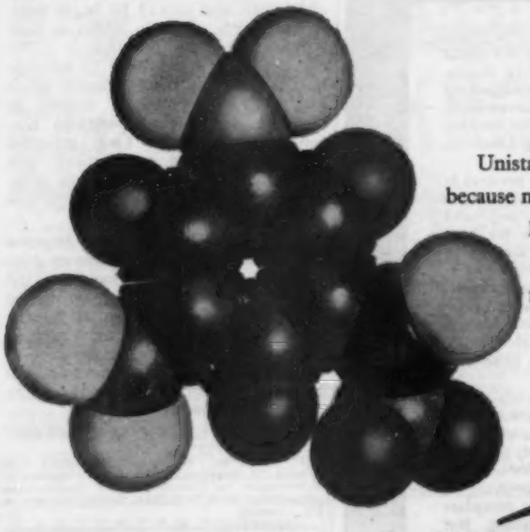

Unistat contains a combination of active ingredients, because no compound, complex, or other chemical entity has been found to be equally effective against all important species of coccidia in chickens. Shown here is the molecular structure of 3, 5-Dinitrobenzamide, the chemical that gives Unistat its superior coccidiostatic qualities.

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INDIANA SPEAKERS—In first picture Eugene G. Byer (left), Farmers Grain & Feed Co., Columbia City, Ind., new president of the Indiana Grain & Feed Dealers Assn., receives the good wishes of Lucian A. Garner, Quaker Oats Co., Lawrenceburg, Ind., retiring president. Madison Clement (second picture), Waco, Texas, president, Grain & Feed Dealers National Assn., speaks to the Indiana conventioners about developments in Washington as they affect the grain and feed industry and the agricultural economy. William E. Breese (third picture), associate chairman, department of commerce, Milwaukee branch, University of Wisconsin, discusses the benefits and hazards of extending credit to customers. "Better Relations Between Veterinarians and Feed Dealers" was the subject chosen by Robert L. Skinner (fourth picture), executive secretary, Western Grain & Feed Dealers Assn., Des Moines, Iowa.

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those substances which induce cancer only over a very long period of time or in only a very low proportion of individuals exposed to it.

Let us agree again that our knowledge of cancer and the carcinogenic process is very limited and will remain so until scientists have made many more discoveries which will help us to predict how the process works.

One thing already accepted by most experts in the field is that there truly is a threshold dose of a carcinogen, below which cancer is not produced in animals. How to convert animal data to apply to human beings is not yet understood, so that we cannot yet predict the threshold dose in man from knowledge of the threshold dose in experimental animals.

Of course, there is a minority view that no such thing as a threshold dose of a carcinogen exists. Prof. Druckrey[2] of Germany has the opinion that "the reason why extremely small doses produce no cancer is not that there is a 'threshold dose' but because the necessary induction time becomes longer than the total life span." Personally, I do not intend to worry about such dose levels.

Regardless of the limitations in our knowledge of cancer, I believe there is one change in the Delaney clause which can and should be made now. A few words could be added so that it reads something like this: ". . . No additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal **in amounts and under conditions reasonably related to the intended use. . . .**" Such language would give opportunity to restore scientific judgment to the interpretation of the Delaney clause.

Regulatory Action That Benefits the Public—A regulatory agency may properly be asked to look for the black threads of hazard lying on the white cloth of public health. It may even be asked to look for the gray threads, if they are important enough. No agency should be asked to look for white threads lying on the white cloth of public welfare.

In the field of cancer we already

2. Druckrey, H., Pharmacological approach to carcinogenesis, Ciba Foundation Symposium on Carcinogenesis. Mechanisms of Action, p. 117 (1958), Little, Brown & Co., Boston.

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know of a few black threads. A few threads may be gray. But our present information indicates that there may be thousands of white threads. They are part of the background of our human life and are certainly not at this stage anything which a regulatory body can or should spend its time on.

Human experience shows us that sensitivity to cancer-producing agents varies widely between individuals. If we can we are, of course, interested in offering protection to those who are most sensitive. Nevertheless, it appears that for those who are so constituted genetically as to be most exquisitely sensitive, only a light pull on the trigger may be enough to set off the cancer process. The trouble is that, in this situation, it seems that countless agents may pull the trigger: Cholesterol, hormones, sugar, salt, sunlight, almost anything.

We cannot eliminate from the human diet all the trace amounts of substances which have been or might be suspected of setting off the cancer process in human beings or in experimental animals. These are the white threads on the white background of human life. We must provide that scientists of the Food & Drug Administration shall be permitted to use reasonable scientific judgment, not giving regulatory recognition to those trace amounts of a food additive so distantly related to the amount and duration of use known to constitute a hazard that no purpose is served by recognizing them.

. . . Calling attention to a few white threads may give the false impression that the normal hazards of living on this earth have been substantially reduced. Let us write our laws and let us set regulatory policy under them so that we will find and eliminate the real hazards, and as many of the gray areas as diligent scientific work will permit us to find. Until that job is done, let's leave the remote possibilities to the future.

'Beef Industry Could Have Been in Trouble'

MADISON, WIS.—The beef cattle industry could have found itself in the same sort of situation because of the use of stilbestrol in cattle feeding as cranberry growers did in the recent scare affecting their industry, Carl F. Neumann, Chicago, general manager of the National Livestock & Meat Board, said here.

Mr. Neumann told the first annual meeting of the Wisconsin Livestock & Meat Council that the beef cattle business could have been attacked for the use of stilbestrol as an additive in feed to increase rates of gains, "If we didn't have some political friends to bang some heads together before the President left on his (11-nation) trip."

He warned that the campaign started by Arthur S. Flemming, health and welfare secretary, and the Food & Drug Administration "isn't over by any means," and that Mr. Flemming wants legislation to give him broader powers in the food certification field.

Mr. Neumann added that Mr. Flemming, whom he referred to as "Sir Arthur," had "a crying towel as long as a well rope in dry country."

Global Contract Signed To Develop Soy Market

HUDSON, IOWA—Development of vastly expanded markets for U.S. soybeans and soybean products throughout the world is foreseen as the result of the signing of a global operations contract for market development work between the U.S. Department of Agriculture's Foreign Agricultural Service and the Soybean Council of America, Inc., Hudson.

The first such commodity contract ever negotiated, according to council officials, this agreement opens up new areas of the world in which P.L. 480 funds are made available for the development of markets for soybeans and soybean products.

Considered a major breakthrough for the soybean industry, the agreement designates more than 40 countries for market development work utilizing foreign currencies acquired by USDA.

TURKEY PROGRAM SPEAKERS—Speakers on the turkey program at the 13th annual convention of the Southeastern Poultry & Egg Assn. in Atlanta, Ga., included (left to right): John McDade, Willmar, Minn.; Dr. E. A. Falls, Raleigh, N.C.; Homer R. Kline, Harrisonburg, Va., presiding; D. D. Moyer, Chicago, Ill., and Marvin Johnson, Rose Hill N.C.

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CITY STATE

Iowa State Researchers Seek to Perfect Flavor Compounds for Swine Rations

AMES, IOWA—Flavors from sow milk promise an economical way of getting baby pigs to eat more feed earlier in life, reports Dr. Damon V. Catron, head of swine nutrition research at Iowa State University. He said this is one of the most common and critical problems of swine production.

Dr. Catron reported he and his staff have "fractionated" sow milk flavors and used camera records of baby pig eating habits to verify test results at the feeders. He said this work should provide further "breakthroughs" in perfecting flavor compounds that will help solve the old problem of palatability in swine rations.

Dr. Catron and his staff have worked on this problem for 10 years. With the help of Dr. Catron's biochemist, Don Jones, and a flavor chemist, Keith Seeler, from a flavor manufacturering firm, they milked sows—both clean and dirty. Then they combined what Dr. Catron described as "the intricate art of organoleptic taste testing" with chemical fractionization of sow milk to isolate the delicate flavors and odors.

"We have reproduced enough of these flavor and odor fractions artificially to improve palatability of most present rations," Dr. Catron said. "However, much work remains to be done to detect the minor flavor odor components. We need to know which flavor and odor components are involved. Also, the intensity or level of each required in the combination must be known to be consistent and accurate in the reproduction of actual sow milk taste and smell. When this work is completed, feed manufacturers will have more effective methods for increasing baby pig feed palatability."

New Techniques

Previous test results on products to increase feed intake have not been consistent, Dr. Catron said. They appear to give positive results under one set of conditions and negative under another. This showed the need to develop new experimental techniques which would verify the accuracy of palatability research results, he pointed out.

So, Dr. Catron enlisted Louis A. Facto, experiment station photographer, in his research team. Mr. Facto remodelled and built minimum time-lapse photographic equipment to record what is now recognized as the first attempt to study the eating, drinking, sleeping and playing habits of baby pigs, Dr. Catron said.

Hundreds of feet of film recorded the moves of every pig in the study over a series of 24-hour periods. "Upon editing and analyzing, the film revealed several heretofore overlooked errors in the commonly accepted experimental techniques used by animal nutritionists in palatability preference tests," he said.

Francis Diaz of Dr. Catron's staff took advantage of the camera record in evaluating several flavor combinations in preference tests with pigs fed a palatable and nutritionally adequate pig starter. Pigs showed a definite preference for some flavor combinations but definitely rejected others. Dr. Catron said this work is being rechecked with further refinements in experimental methods.

Dr. Catron pointed out that the discovery is important because the period from birth to 25 lb. is the most critical stage in the pig's life. Baby pigs double their weight in the first week of life—triple it by the time they are 2 weeks old. Normally, sows reach their peak milk flow about three weeks after farrowing. Pigs like sow milk. That's why it's difficult to get them on dry feed before they are 3-4 weeks of age, he said.

Although sow milk is most palatable and almost perfect nutritionally, Dr. Catron pointed out, it is deficient in iron needed for anemia prevention. Dr. Catron added that research in Denmark shows that final carcass leanness is influenced by the rate of baby pig growth from birth to 8 weeks and especially during the first four weeks. The faster the baby pig grows, the leaner the carcass will be at market time.

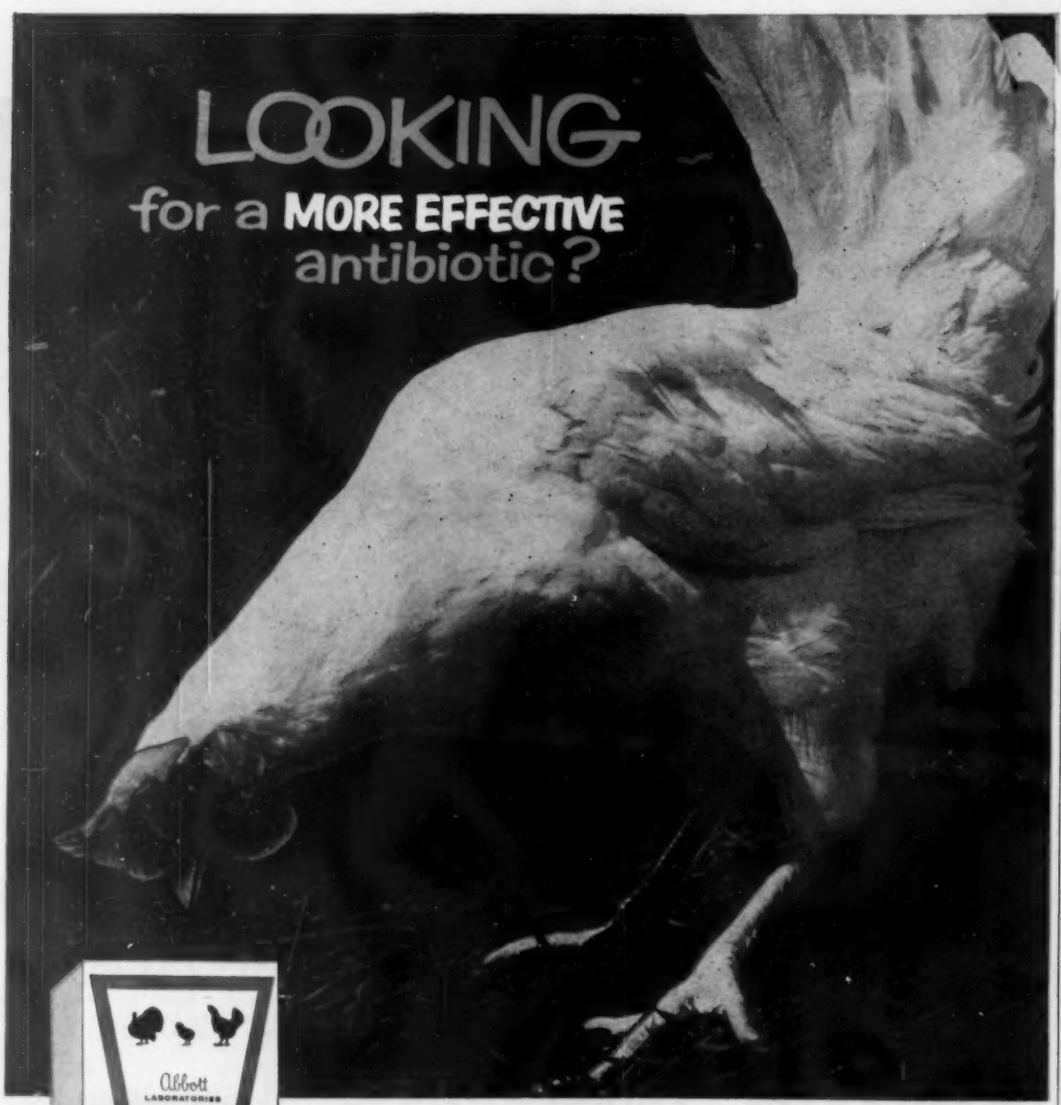
Besides, Dr. Catron said, pigs, even on good-milking sows, need extra feed if they are to reach their maximum bred-in growth capacity. At 2 weeks of age, they run out of the disease-protective antibodies from the sow colostrum and are not yet able, at 4 weeks of age, to make their own protective antibodies. The easiest and most economical way to get essential health-protecting feed additives, such as antibiotics and arsenicals, into baby pigs is through dry pre-starter and starter rations. This puts a premium on maximum palatability in these critical formulas, Dr. Catron said.

"Many of the practical and commonly used ingredients in swine feeds —such as alfalfa meal, distillers' dried solubles, meat scraps, tankage and even the necessary minerals— are not palatable," he said.

Iowa State University researchers who worked on palatability in the past included Vaughn Speer, working with dry pre-starter rations; Charles Lewis, who discovered the baby pig's "sweet tooth" for sucrose; LeRoy Nelson, who discovered pig's liking for sugar-coated pellets (but these were difficult and costly to manufacture); George Combs, who showed pigs have no color preference for pellets; Don Hudman, who found that lactose (milk sugar, most economically supplied by dried whey) gave best growth and feed efficiency, and Stanley Adlinger, who found saccharin could economically provide the desired sweetness.

S. D. CLOUGH DIES

NORTH CHICAGO — S. De Witt Clough, 80, retired chairman of Abbott Laboratories, died at his home Jan. 31. Mr. Clough was with the firm 49 years.



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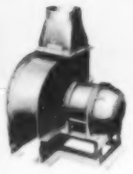

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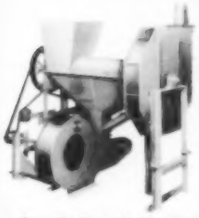

Corn Sheller with blowers for grain and cobs

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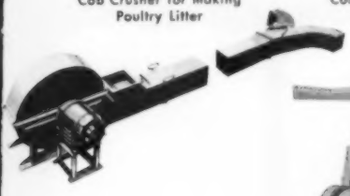

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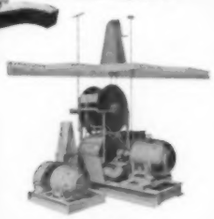

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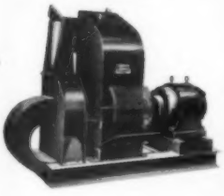

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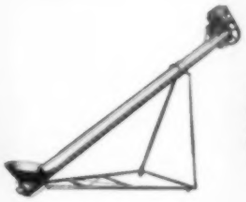
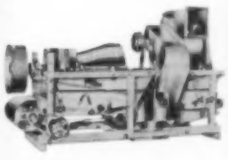


Portable Screw Elevator



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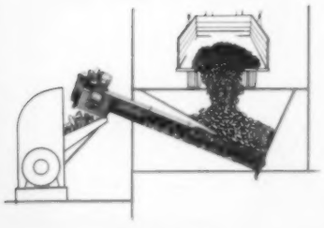

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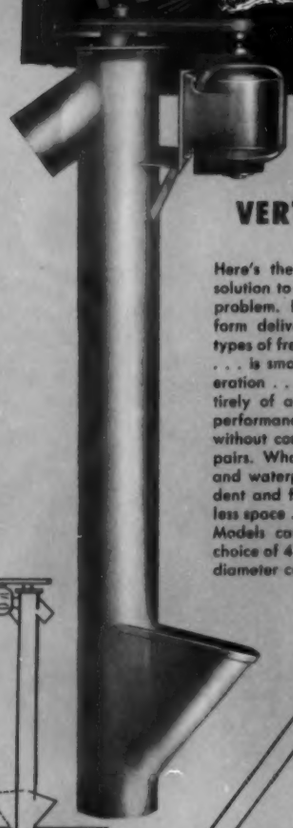

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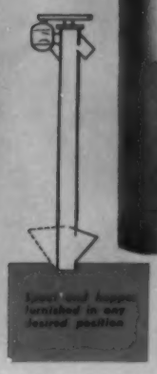

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Price-Cost Squeeze May Make Credit Harder to Obtain

LITTLE ROCK, ARK. — Because of the price-cost squeeze, agricultural credit may be harder to obtain in the future, bankers were told here.

Two speakers at the annual Agricultural Credit Conference of the Arkansas Bankers Assn. said bankers are taking a closer look at the credit risks of loans for farm customers.

R. A. Porter, vice president, Farmers Bank & Trust Co., Blytheville, Ark., said, "In making loans a banker has to ask himself if he is justified, on a sound business basis, in lending the additional funds to make a crop when the price of farm products is declining and the cost of everything the farmer buys is increasing."

Dr. Gerald T. Hudson, dean, College of Agriculture, University of Arkansas, said: "Agriculture is perhaps the most efficient segment of the economy. The manpower needs are declining steadily, while the output is increasing so rapidly that we cannot find markets for some commodities."

"This could only mean that farmers are making better use of their resources and manpower in producing food and fiber. It does not follow that they are making more profit."

Mr. Porter said: "We have not lost a dollar on farm equipment loans, but we certainly have lost a lot of sleep over them."

Speakers outlined the following problems facing agriculture and bankers:

- Credit requirements will increase as farms and agricultural operations become more mechanized.
- Farm prices may continue to decline.
- Size of farm units will grow.
- Bankers will need higher interest rates.

Speakers generally predicted that farm prices will probably drop even lower in the coming year. Lower support rates, over-production of grain commodities and large inventories of livestock were blamed for the expected drop.

Broiler Outlook

The outlook for broiler production and processing was analyzed by Don Tyson, Springdale; William E. Drenner, Ft. Smith; M. W. Simmons, Siloam Springs; Harold Snyder, Dardanelle, and J. K. Sutherland, Batesville.

Mr. Simmons predicted expanded exports would help sagging broiler prices. He said West Europe looked like a promising area for exports.

Mr. Simmons and some of the other speakers agreed that prices are not likely to rise above 16¢ lb. for some time to come. But, they indicated they could "live with this price."

The speakers predicted that improved breeding and management will continue to increase feed efficiency, giving producers better profits at lower prices.

Jerry Sotola, Chicago, associate director of research, Armour & Co., predicted the "cattle slump" will come in 1962. He also said hog men are "wondering what effect the huge stocks of corn will have on pork prices."

Connecticut Broilermen Go Out of Business

NORWICH, CONN. — Pressure of poor prices has caused some of the broiler producers in eastern Connecticut to go out of business.

The number of broilers produced and sold in Winham and New London counties declined from about 18 million birds in 1958 to about 16 million in 1959.

The facilities formerly used for broilers have been transferred to egg production or, in some cases, remain empty.

Transfer of poultry facilities from broiler to egg production has resulted in continued expansion of egg output.

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Are Cow Pools a Step Toward Integration?

"Large specialized operations such as a cow pool may attract potential integrators."

By Dr. J. R. Strain
Iowa State University

EDITOR'S NOTE: What's the basis for interest in and, on the other hand, concern about the use of cow pools? This article—from Iowa Farm Science, a magazine published by Iowa State University at Ames—answers this question and covers various aspects of cow pools. Dr. Strain is assistant professor of agricultural economics specializing in dairy marketing.

Vertical integration among dairy farmers is relatively common today. They've long affiliated themselves together in cooperative butter and cheese producing associations. Large cooperative bargaining associations with surplus grade A handling facilities—and, lately, bottling and distributing facilities have permitted groups of producers to extend their control over their milk beyond the limits of the barnlot driveway. Acting jointly through a cooperative association has enabled these producers to vertically integrate on their own.

If vertical integration is nothing new to farmers, why the recent flurry of interest in the subject? Probably because of questions in two areas.

The first involves who will do the integrating? Farmers are realizing that others—such as feed companies and retail grocers—also are investigating the possible savings of vertical integration.

The second concerns the speed at which integration can take place. In the past, the methods of integration more familiar to farmers depended upon the relatively slow process of accumulating money to build or buy additional firms—or of developing cooperative associations of farm firms for joint ownership of facilities to perform the next step in the marketing process.

But today, companies national in scope could conceivably, through contract, obtain rather complete integration between two or more phases of production, processing or marketing without the usual time lag and fund accumulation needed for acquiring ownership of the facilities.

Horizontal Integration

Horizontal combination or integration occurs when two or more firms at the same level of production, processing or marketing combine into one unit. In the dairy industry, for example, horizontal combination occurs when two or more creameries merge or consolidate into one business unit.

Combinations of this type have been quite common at the farm level also. Between 1940 and 1954, for instance, 213,000 Iowa farms combined into 193,000. Growth in the average size of farms has also been accompanied by increased specialization. In 1940, 90% of the 213,000 Iowa farms produced milk. In 1954, only 68% of 193,000 farms produced milk. Similarly only 2.2% of all farms milking cows received at least half of their income from the sale of dairy products in 1945. But nine years later, in 1954, 4.4% did so.

Increased production per cow has accompanied specialization in milk production. The total number of dairy cows in the state dropped from near 1½ million in 1943 to less than a million in 1958, though total milk production has remained fairly constant. The 1947-56 state average was 6,073 million lb. of milk annually. In 1958, production was estimated at 6,163 million lb.

Not Vertically Integrated

Cow pools, as such, aren't a part of vertical integration. They're merely another step in specializing milk production. In a cow pool or contract milking arrangement, the milking and feeding of cows has simply been separated and set aside from the other activities performed by the farm family. A specialized firm, the cow pool, has combined the milking operations of many farm firms through contractual arrangements. Thus, cow pools are examples of horizontal combination rather than vertical integration.

The cow pool differs from other specialized large milking units. Both types represent an extension of the trend in horizontal combination of milk production. But the cow pool collects cows through contracts with many farm firms, while non-pool milking units collect cows by acquiring ownership or buying them.

Either means of horizontal combination conceivably could replace the 125,000 farmers milking cows in Iowa in 1954 with less than 1,000 milking units of around 1,000 cows each. And, if increase in output per cow accompanies this increased specialization as it has in the past, even fewer units would be needed to maintain Iowa's present milk output.

May Attract Integrators

Large specialized operations such as a cow pool may attract potential integrators. Feed companies may wish to form or affiliate themselves with existing pools to make the outlet for their feed more certain. Some cow pool operators may choose to own their own hauling equipment—integrating themselves with one more step toward the consumer.

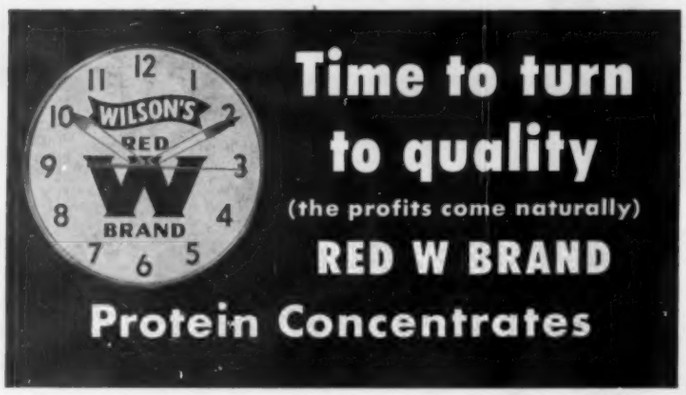
Some potential cow pool operators are indicating a desire to integrate—either through ownership or contractual arrangement—their milk-producing unit with a milk-processing and distribution firm. So the cow pool, while basically a horizontal combination, seems to lend itself to possible vertical integration.

More Efficient?

There are still some questions as to how widespread a cow-pool-type of arrangement can become. Present interest in cow pools in Iowa is based almost entirely on a marketing phenomenon rather than a production efficiency phenomenon. The cow pool has offered a number of farmers the opportunity to move from a manufactured milk market to a superior grade A market without investing in buildings, equipment and bulk tank coolers and without learning the skills necessary to produce grade A milk.

If cow pools become more prevalent, opportunities to shift manufacturing milk into grade A outlets will diminish or disappear completely. If that happens, the only basis on which new cow pools could be started would be on a production efficiency rather than a market basis.

The relative production efficiency of a cow pool as compared with a large farm herd hasn't yet been satisfactorily determined. It appears at



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EGG PROMOTION—Dorothy Taylor, Georgia poultry princess, was on hand at the Southeastern Poultry and Egg Assn. convention in Atlanta to aid the Hess & Clark "Golden Goodness of Eggs" promotion. Miss Taylor presents a sample to retiring president Henry C. Tilford, Jr., while William Lunceford (left), southeast district manager of Hess & Clark, and John Naumann, sales manager of Babcock Poultry Farms, Inc., look on. Babcock's southeastern franchises provided the 20,000 eggs handed out during the three-day meeting.

this time, however, that a cow pool arrangement can produce milk with considerably less physical facilities and physical costs per cow than can the average small Iowa dairyman. But physical efficiencies are only slightly greater than those of large efficient dairymen. Thus, the prices paid for labor and other expense items in a cow pool could possibly be enough higher to offset the physical efficiencies. Put another way: Many producers don't value their labor or managerial skills as highly as they must pay for them in a commercial milking operation.

If cow pools can provide a lower-cost method of producing milk than even our largest one-man dairy herds, cow pools will be likely to develop as follows: Privately owned and operated cow pools probably will be replaced by large milking units in which both the cows and facilities are owned by the operator or a corporation using investment capital. If large milking units are a profitable way for farmers to invest money, they probably will be profitable also for non-farm investors.

If this is true, then the present cow pool arrangement must be considered as a convenient or necessary stepping stone or transition from farmer-owned cows to pool operator or corporate-owned cows. The milking facilities operator, for example, will find one board of investors less complicated than 60-80 farmers with interests in specific cows. In addition, record-keeping and payments to investors would be greatly simplified and less costly if all of the cows can be considered in one herd rather than in separate or several herds.

Cooperative Cow Pools

In the past, farmers have invested money off the farm in cooperative creameries, cheese factories and bargaining facilities. The cow pool may offer an additional opportunity for cooperative investment. Investment in cows in a cow pool, for example, might permit a farm operator to tie up or integrate his marketing of grain and roughage without hiring extra farm help to care for a herd of cows.

Investment in a cooperative cow pool could be coupled with existing investment in cooperative milk-processing plants. This kind of arrangement, through a cooperative association of farm firms, could permit almost complete vertical integration between an individual farm firm and the retail sale of milk and milk products.

Producers, on the other hand, may not wish to integrate in this type of operation cooperatively. If not, other forms of investor capital soon may be willing to integrate the production and marketing of milk and milk products for them.

Another Possibility

Another and more far-reaching implication of the cow-pool idea is that it possibly can produce milk at a lower cost than our present farm herds. If so, we must anticipate more milk at present prices, a general lowering of milk prices, or both—similar to what has happened in the poultry industry. This, of course, would mean increasing difficulty for the small producer with but a few cows.

In these circumstances, cow pools would hold another implication for our manufacturing creameries and cheese plants. As milk switched from our present creameries to a cow pool seeking a grade A outlet, the volume of ungraded milk available to our existing plants would decline. The day when all milk sold is grade A milk would be hastened. Similarly, the trend toward manufacturing milk products being made in central surplus disposal plants from excess grade A rather than from ungraded milk would be hastened.

And finally, a widespread and wholesale integration of milk production units with processing and distribution systems could do more than merely lower the general price for dairy products. It could close the grade A markets now available to the relatively small and less efficient dairyman. This could also be true for the independent grade A processor.

Group Urges Change From Bushel to Cwt.

MADISON, WIS.—A plan for nationwide elimination of the bushel as a weight measure was favored here at a recent meeting of farm leaders, feed dealers, agricultural extension men and vocational agriculture instructors with officials of the Wisconsin Department of Agriculture.

Following the meeting, a telegram was sent to Ezra Taft Benson, secretary of agriculture, urging that the change from bushel measure to the use of the hundredweight be made.

Clair Jackson, head of the State Department of Agriculture's weights and measures division, said "the use of the bushel in grain movements has become increasingly cumbersome" because of mechanization in agriculture.

He noted that grain actually is not measured by volume at all, but by weight, with the bushel a "derived measure" of volume in which pounds are converted to bushels. He said that the U.S. Department of Agriculture had determined that as many as 12 conversions are made on grain as it moves through commercial channels.

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Broiler Industry Urged to Stress Nutrition Story

ATLANTA, GA.—"To the average American homemaker nutrition is more important than ever before in the history of our country. The growing desire of Mrs. Consumer to provide adequate health and nutrition for her family has created an atmosphere which the broiler industry can and must take advantage of in marketing its product," Barbara Hunter, public relations counsel for the National Broiler Council told a gathering at the Southeastern Poultry & Egg Assn. convention.

"The greatest jolt to American complacency in regard to food and food habits came in October, 1959, with the publication of a $2½ million study by the Society of Actuaries. This study pointed out that the average American is over the best biological weight by 15-20 lb.!" she said. "Men and women below the average weight by that many pounds stand in the least jeopardy of early death and almost certain crippling ailments."

Where does chicken fit into this picture? Chicken is an excellent diet food, Miss Hunter pointed out. It is one of the first meats a child eats and is a standby for oldsters who need a high energy, easily digested, low calorie diet. It has top billing on most hospital menus and in many types of special diets. Naturally, one first looks at the calorie situation. According to the U.S. Department of Agriculture, three ounces of broiled chicken without bone contains 115 calories. A 3-ounce boneless portion of steak contributes 375 calories.

"However, the calorie content is by no means the whole story," she noted. "Many dieters get insufficient protein, because, unfortunately, many protein-rich foods are also high in calories. You have only to think of cured cheese, as one example. One three-ounce portion of chicken contains 20 gm. of protein and 3 gm. of fat. The beefsteak—the lean portion —has 17 gm. of protein and 4 gm. of fat.

"The broiler industry is lucky," she noted. "You have a product that is universally popular. It is hearty enough for the man of the house, elegant enough for guests; low-calorie enough for women—nutritious for special diets and growing children; easy enough for busy homemakers and the 21 million working women; delicious enough for everyone."

Tell Nutrition Story

How can the industry take advantage of the growing nutrition consciousness and capitalize on it to sell chicken?

The best place to start telling the nutrition story is with the people concerned with nutrition—the professionals in the field, she said. "We need to reach the doctors and through them their patients. We need to reach the teachers and through them their students."

She urged the industry to continue its current service program to the consumer on how to use chicken. How to take advantage of its nutritional values in a variety of ways. Every meal is open, she said. Why not chicken for breakfast, chicken for lunch, dinner, snacks, especially for teenagers—and so on down the line?

It might prove profitable for the industry to develop special products for particular meals, Miss Hunter said. "Is there anything wrong with broiler industry know-how that we cannot develop another breakfast meat? Nutritionally, chicken has more to offer than ham, bacon or sausage—let's make the most of it—how about chicken sausage for breakfast and chicken burgers for lunch?" she asked.

"The more we have learned about nutrition and broilers, the more we are convinced that you have a great opportunity to really capitalize on the growing awareness of the importance of nutrition to your real customer—Mrs. Consumer."

"He's been doing it for 16 years, but some day he'll start a fire with that pipe."

Large Dairy Herds in Michigan Not Likely

EAST LANSING, MICH. — Michigan dairy herds of 500 or 1,000 cows, like those in California, don't seem a very likely possibility to the head of the dairy department at Michigan State University.

Dr. Charles A. Lassiter, who visited such large herds in California last summer, made this report to a Farmers Week audience at Michigan State University.

"The two states are so different," he told dairymen, "that I do not expect our dairy operations to be patterned after those on the West Coast in the foreseeable future."

Dr. Lassiter pointed to differences in climate as one of the chief reasons for his conclusions. The mild weather in many parts of the Golden State requires very little housing other than a milking barn. He found that most all commercial operations are in dry lot with cattle fed hay and grain the year around with almost no silage or pasture feeding.

The dairy scientist described the typical California dairyman as a very good manager who has the ability to buy both good cattle and good hay and who places important emphasis on good milking practices.

Very few herds are milked in a milking parlor. The stanchion barn holding 30-90 head appeared to be the predominate type of barn, Dr. Lassiter reported.

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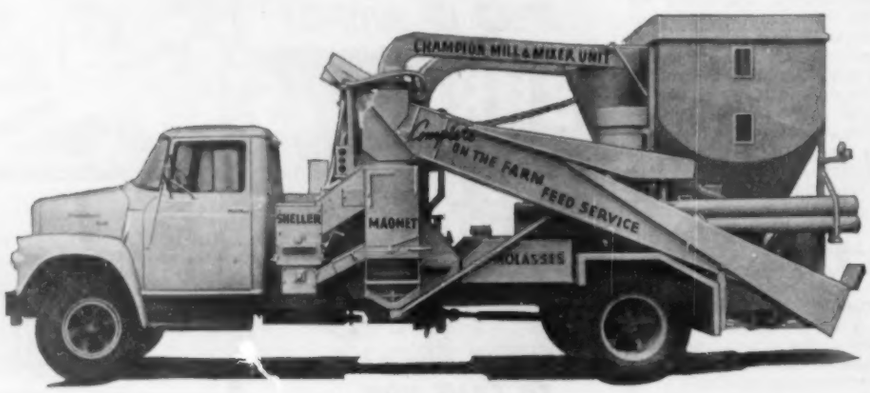

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How Farm Trends Affect You

"If we seem to make some foolish moves in the feed business as we flounder around trying to find our place in this new automatic feed age, it may be that some of us become desperate when we see others taking over our function or a function that we thought was ours."

By Maurice Johnson
Professional Feeds

EDITOR'S NOTE: Perhaps the biggest problem confronting planning-level executives of feed firms these days is in trying to determine just how their businesses can or will fit into changing patterns in the production and marketing of the products of animal agriculture. A leading feed man's comments on various farm trends will be found in the accompanying article, which is from a talk at the last Midwest Veterinary-Nutrition Conference. Mr. Johnson is executive vice president of the Professional Feeds Division, Spencer Kellogg & Sons, Inc., Kansas City, and has been serving as president of the Midwest Feed Manufacturers Assn. Mr. Johnson's remarks were addressed primarily to veterinarians, and he pointed out, for one thing, that the feed industry now needs qualified veterinarians "because the number of animals we are either feeding or financing is so great and so concentrated." However, in discussing the implications of trends for veterinarians, he also noted a number of developments of interest to feed men. The accompanying article consists of excerpts from Mr. Johnson's talk.

Feeding today is taking two directions. One is contract feeding with specialized production for a specialized market, and this can be started by the big feeder, by the feed manufacturer, by a local veterinarian or by a packer. It can be started by anyone and the ghost that comes up to frighten us is that when anyone else starts one, they are likely to tag a feed mill onto one end of it and there goes our business.

Seriously, many of the large poultry feeders in California who have 100,000 to 250,000 chickens on one ranch, very quickly feel that they should be making their own feed. Many of the feedlots, perhaps most of the large feedlot operators, now build their own feed mills.

One large turkey feed manufacturer told me last year that he was so proud of what he had done in the turkey business when he inspired one man to raise 150,000 turkeys over a period of five or six years. As this man grew in knowledge and ability, he got bigger and bigger—all the while being completely financed by this feed manufacturer. Last year he announced to his patron, the feed company, "I'm sorry, Ed, but I'm going to build a feed mill," and there went 10% of his turkey business.

So if we seem to make some foolish moves in the feed business as we flounder around trying to find our place in this new automatic feed age, it may be that some of us become desperate when we see others taking over our function or a function that we thought was ours.

There is also the other type of feeding that is done by the 40, 50 or 60% of the people who are employed in a city. It has recently been found that 40-45% of all so-called farmers in the U.S. have another job, 60-70% of all of the farmers in a seven county area around one city work elsewhere.

What kind of farmers are they? They are not seriously relying on hogs, chickens, dairy cows, or beef animals for their income. They do some of it as a side line and they continue as side-line operators.

You have contract feeding on the one side and side-line feeding on the other. All of it acts as a supplemental type of feeding to the enormous year after year feeding practices that exist throughout the cornbelt, and you wonder if both of them will not make inroads into this historical feeding pattern.

Inroads are already being made in that area by a rather fantastic exodus of poultry from the middle west. In one state alone in the middle west, 27% fewer chickens are being placed this year than last year. Next year if the price of eggs stays where it is now, there'll be 27% less again and it won't be very long until that state has as few chickens as it now has horses and mules. Farmers do not have to have chickens. What will prevent other types of livestock feeding from leaving this same area? Let's pick off a few of the types of contract feeding and concentrated feeding that are developing and see what is happening in the various types of agricultural development.

Feedlot Problems

In cattle feeding, they are feeding much larger numbers. There are at least 3,000 and probably 5,000 feedlots in the U.S. today. At least twice,

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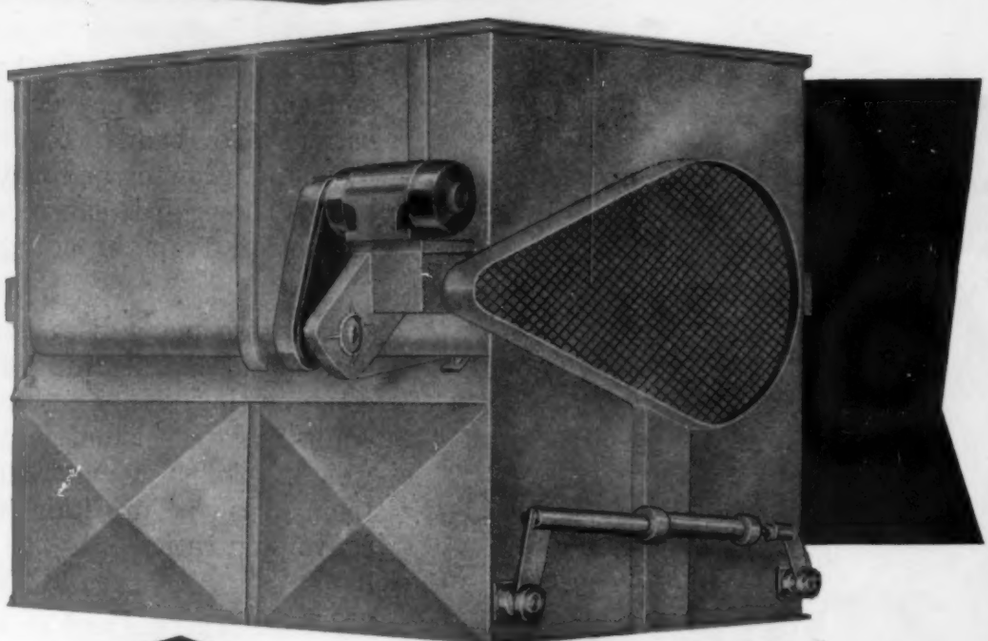

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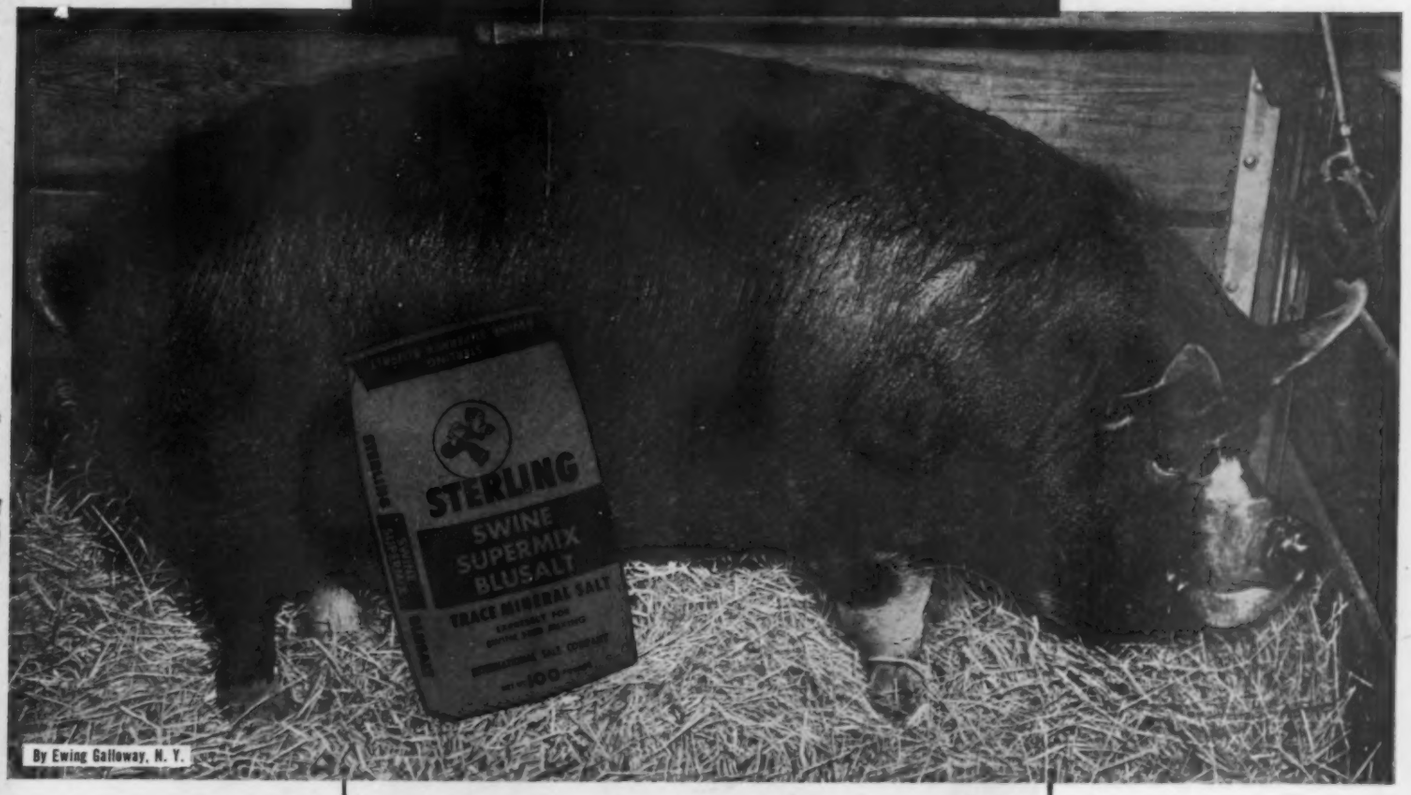

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or maybe four times, as many as there were five years ago.

The largest cattle feeding state in the Union is not Iowa, it is California. Iowa is now second. Nebraska is third. Colorado is very close and Florida is coming up fast. So are Georgia and Tennessee. Half of the cattle fed in the U.S. this year are being fed in feedlots. The average size of a feedlot in Arizona and California is about 8,000 or 9,000.

According to the new magazine, "Feedlot," 11,639,000 of the cattle fed this year are in feedlots. Who is doing this? In many cases the large successful cattle feeder himself. The packers are doing it both by contract and by direct feeding on their own. Some enterprising businessmen are doing it. All you have to do is to drive north out of Denver about 50 miles and you will be astonished to see that feedlots are packed up against each other, mile after mile, and at every one there is a feed mill or a type of feed mill. The packers are either doing it or they are taking from these feedlots the cattle they need.

Many of the large feedlot operators are beginning to talk about putting up their own packing plant. Like the feed companies, the packers are seeing others get into their business and these others know a little more about procurement perhaps than the packer knows himself because they are the ones who are delivering the goods to the packer.

Different types of feeding in feedlots are occurring. Cattle are being put on feed in 24 hours. They are being fed in self-feeders without roughage on the side. They are being mechanically fed silage, hay wafers, high roughage pellets, and they are being t r e a t e d like chickens in a chicken house.

The feed mills that feed these animals are often feeding the neighboring herds of beef cattle on a contract basis or on a straight cash basis. Where are these feedlots going to locate, are they going to follow the pattern I just described or are they going to go everywhere? The only place in the U.S. where they do not now exist, is in New England, and I guess they just don't want to have cattle up there. They exist in almost every other state. They either go to the location because of the market or the grain and roughage.

Specialization

I am sure that many of you are familiar with the calf-type farms starting in some states, where people specialize in production of calves and move them into the large dairy farms. I am sure that you see the dairy concentration starting to move as the small farmers get out of the seven cow class and go to work in the city. The larger operators, often in other locations, are buying their cows and making a business out of it. In studying this problem I called the Bank of America in San Francisco and asked for their vice president in charge of dairy problems, and said I'd like to know on what basis they loan money on dairy cows in California. He said they will loan 50, 75 or 100%. If a man has less than 30 cows, they loan him nothing. If he has from 30 to 40 cows they will lend him some, but if he gets up to 60, 80 or 100 they frequently will go all the way. I think that speaks for itself.

Contract feeding in the production of eggs has become rather a wild topic in the feed business in the last year or so. The marketing arrangements are interesting and the problems devastating. Concentrating 5,000 to 10,000 hens under one roof is a lethal problem, and not very many people have solved it.

However those in this industry who are hungry to replace the business that the typical farmer is abandoning are trying, losing, fighting and scratching to make it work. One company announced that it is starting a concentration of a quarter of a million hens in the Jackson, Miss., area. Another company said they are going to have 700,000 under their direct control in Oklahoma.

The location of this particular activity seems to be moving in the same directions as broilers, moving south where chickens do better, eat less, are cared for by lower paid employees and where buildings don't cost as much. Contract broiler production is disappearing and the integrated production of broilers by the processor or by the feed manufacturer or by the hatchery is becoming standard. If you can save a quarter of a cent by producing your own broilers, you do it because you're financing yourself anyway.

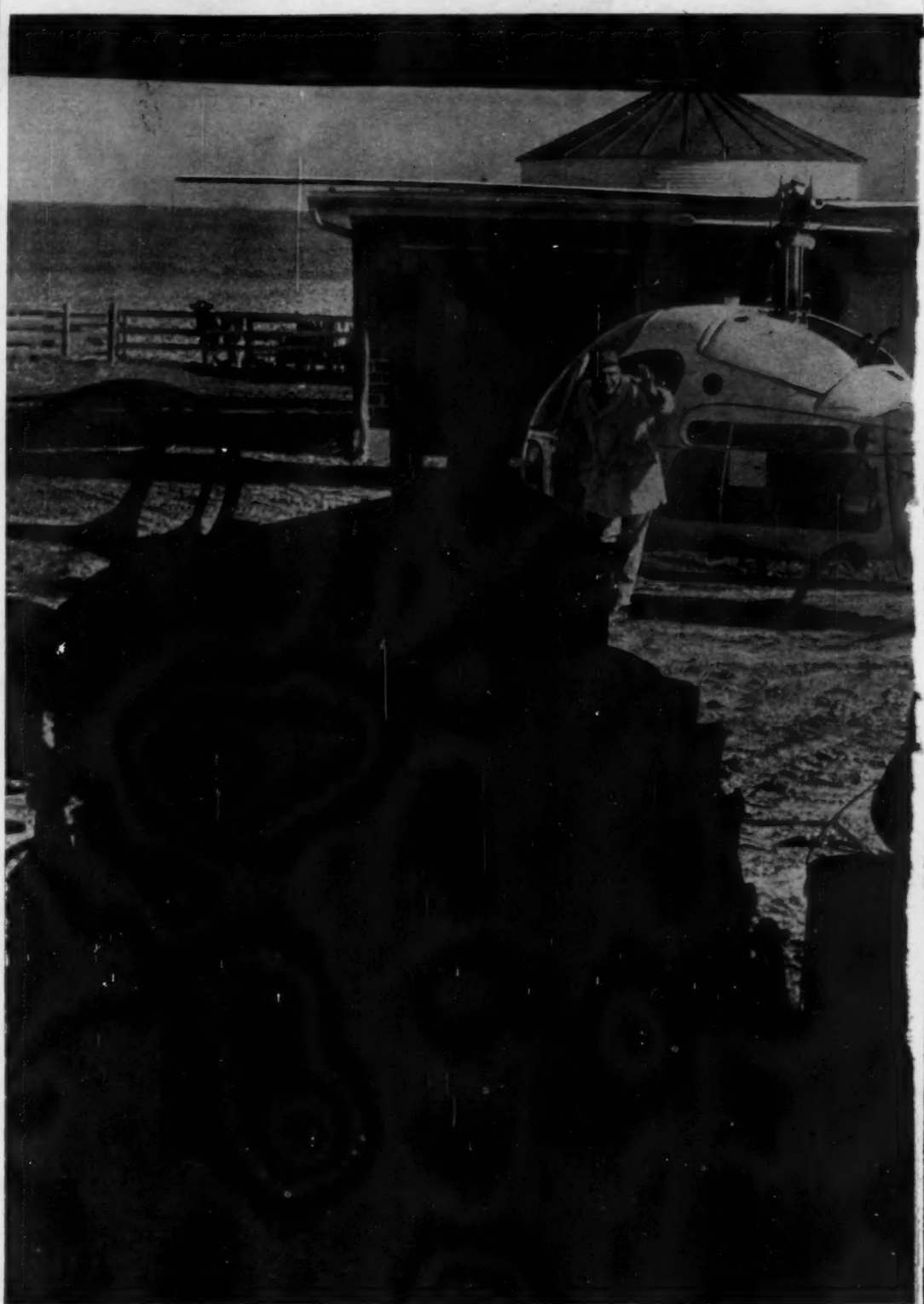
Not long ago any person interested in raising turkeys would have 10 feed men rush up to him and say, "Where are you going to do it and here's the money." Now, the feed men are beginning to realize from their financial statements, and other evidences, that if they are going to do it, perhaps they had better own these ventures. This is not always true but it is becoming a little more true every year.

There is enough evidence along this line to make us feel that we are going to see more and more of large control production of turkeys, broilers and eggs.

In swine this is not so evident. There is some contractual production of swine, but not much. It seems that the rather difficult life cycle of a sow and her progeny keeps the total production on one farm. But it does not mean that this will not change nor does it mean that it will stay in Iowa, northern Missouri or Illinois and Indiana.

It means that as the science of producing swine develops, production itself will go to Colorado, the panhandles, and the areas that have the advantages of the market for this kind of production. Not as fast as poultry and feedlots, but there are compelling reasons for swine to be produced in places in addition to Iowa and adjoining sister states.

The forces behind these developments are many. The desire of the feed manufacturer to sell feed is not the only one. The desire of the farmer to make more per head is important. The desire of the packer or processor to have a uniform product that he can depend upon, and the desire to cut every last mill off the cost of producing a pound of any kind of livestock take their place in the discussion. The desire to maintain investments that are going begging for a product, such investments as the huge egg-breaking plants that are



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watching the flocks leave, packing plants in Omaha, East St. Louis, that are watching fed cattle in some cases move into other areas—all are factors. These investments are huge and the operators feel that they must do something to keep the production of livestock they need in an area where they can get it.

These are sobering things and they do not happen over night because they take so much money, manpower, planning and courage. Perhaps it takes more courage to stay out of it. If you stay out of it and watch the chickens disappear and watch the cattle go into the hands of others and watch the swine being fed by some other system, you see your own business disappear as the farmers change their directions.

Livestock School Held

WALTHAM, MASS. — Ten Wirthmore Feeds, Inc., livestock service representatives took part in a five-day course in advanced salesmanship and livestock service at the company's home office and research center here.

Among those participating were: C. J. Benson, Holton, Maine; R. W. Whiteman, Greenfield, Mass.; C. L. Cassaday, West Rutland, Vt.; C. E. Dinsmore, Bolton, Mass.; G. C. Newcombe, Middleboro, Mass.; H. E. Holm, Red Hook, N.Y.; W. A. Russell, Jr., Waterville, Maine; R. G. Pray, Poughkeepsie, N.Y.; G. L. Manning, Newport, Maine, and K. Slaughter, Plattsburg, N.Y.

The field representatives attended the premiere showing of the firm's new 16 mm. motion picture "A New Day in Agriculture." Other features of the sales-service session included presentation of the firm's current service literature, recent developments in nutritional research and detailed explanations of the company's latest feeding and management recommendations.

Wisconsin Economist Stresses Integration At Marketing Level

MADISON, WIS.—The question is no longer whether integration is coming to the egg industry, but rather "how much and how soon," Dr. Raymond Penn, University of Wisconsin agricultural economist, said.

Speaking at a poultry industry luncheon held in connection with the annual University of Wisconsin Farm and Home Week, Dr. Penn said that egg producers may be facing integration on a marketing level if they are to survive. He said the producers will have to come up with a product attractive to consumers in kind, quality and price.

Warning that "those who are not integrated to the market will lose out," he said producers and the egg industry will have to gear production to conform with market demands.

He said that to do this, egg producers "will need technological assistance and information, sufficient credit to finance necessary changes and bargaining and selling agencies such as cooperatives or trade associations that can discipline members to produce the kind and type of product needed." He said that "possibly even marketing orders or other government regulations will be needed."

Until now, the emphasis has been on integration as it applies to the production end of the industry, Dr. Penn said, but in the future production and marketing must achieve a balance. Noting that integration is sometimes blamed for low prices in the egg industry, he asserted that a more important factor is the increased rate of technological change, resulting in the production of more eggs per hen. He pointed out that egg demand has not increased as much, and supply forces the price down.

In a later panel session, five panel members agreed that there is an increase in integration in the egg industry. They cited needed capital for expansion and the need for better quality eggs as major factors in the increase in integration.

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Dr. Salsbury's Names Territory Manager

CHARLES CITY, IOWA—John F. Brantley, formerly of Forest, Miss., and a recent graduate of Mississippi State University, has joined Dr. Salsbury's Laboratories as territory manager in eastern North Carolina. His territory headquarters is located at Goldsboro.

J. F. Brantley

Majoring in poultry husbandry, Mr. Brantley had completed two 4-day sessions of the firm's poultry short course while a student at Mississippi State. During a month of orientation before his territory assignment, he attended a third 4-day course in poultry disease recognition, prevention and control.

His experience in the poultry industry also includes three summers of employment by Fred Gaddis at a Forest, Miss., feed mill which furnishes feed to broiler growers.

To Use Thyroxine in Bull Breeding Study

JONESBORO, ARK. — Arkansas State College, Jonesboro; Agri-Tech, Inc., Kansas City, and the U.S. Department of Agriculture have started a research program for improving breeding of bulls.

Dr. L. N. Hochstetler, professor of animal husbandry at Arkansas State College, will be director of the program.

"Basic research has already indicated that semen production is influenced by the amount of thyroxine secreted by the animal," Dr. Hochstetler explained. "In our research there will be involved the usage of supplementary thyroxine, which we believe will increase the breeding efficiency of bulls."

Agri-Tech, Inc., will provide the thyroxine in the form of Protamone, a thyroprotein. The experiment in using thyroxine, a metabolic hormone, will continue 45 days. In this research activity, the methods will be applied to Herefords of the beef family and Jerseys, representing dairy bulls.

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Illinois Testing Automatic Feeding Of Dairy Cattle

URBANA, ILL.—A completely automatic feeding system for dairy cattle is the goal of new dairy research now under way at the University of Illinois.

Researchers there are mechanically feeding a mixed alfalfa hay and grain ration to two separate lots of dairy heifers. Automatically operated augers, hoppers and belts carry feed from outside storage bins into a feed-processing building and finally to the feedlot.

When tests with heifers are completed, researchers will expand the operation to automatically feed different rations to four groups of milking cows, explains Prof. K. E. Harshbarger, dairy scientist in charge of the project.

Tests indicate that self-feeding will work if cows receive a constant level of roughage and if grain feeding is adjusted to production.

Grinding, Mixing

Gene Shove, agricultural engineer, has designed a working method for automatically mixing and transporting grain and roughage to the feedlot.

Four-inch augers carry grain and protein supplement from hopper-bottom storage bins to an automatic hammermill. After blending and grinding, an auger delivers concentrates to a small holding bin, where a vibrator feed meter drops correct amounts into the roughage.

A revolving floor mat moves hay from a front unloading bunk feeder wagon onto a conveyor belt in front of the wagon.

As the forage wagon unloads, concentrate is metered onto the roughage, and a distributing auger conveys the complete ration to the feedlot. Divider boards direct the mixture to the proper bunk.

Prof. Harshbarger says the automatic equipment is successfully feeding two lots of heifers. It's delivering a 15% concentrate-85% roughage ration to one group of large heifers and a 25% concentrate-75% roughage ration to smaller heifers.

Once the machinery proves itself, researchers plan to build additional facilities to handle milk cows. Here's how the setup will work:

Cows will be divided into four production groups labeled "very high," "high," "medium" and "low."

When a high producer calves, she will be placed in a lot with the "very high" producers and be fed according to the production average of the group. As production drops toward the end of her lactation period, she will move to another lot with the next, or "high," production group. There she will be fed according to the average of this group.

This process will continue until she finally ends up with the "low" producing group, which will contain low producers, dry cows and heifers.

So far, the main object of the study has been to test the automatic equipment. Prof. Harshbarger says that in later tests remote switches placed in the feed bunks will keep feed before cows at all times.

Distributor Named

MASON CITY, IOWA—The appointment of Carroll Sales Co., Mason City, has been announced by Pannier Bulk Feeder, Inc., Bloomington, Ill., to act as its distributor in northwest Iowa and southern Minnesota.

Carroll Sales Co. has warehouses located at Spencer, Iowa, and Albert Lea, Minn., as well as in Mason City.

Pannier Bulk Feeder, Inc., is manufacturer of large capacity bulk bin feeders for both hogs and cattle, with factory location at McLean, Ill.

Allege False Claim

PHOENIX, ARIZ.—Rulon Goodman, operator of a chain of Tucson, Ariz., supermarkets, has been charged with filing a false claim to emergency low-cost cattle feed in 1956. The government seeks to recover $4,500.

The suit alleges that Mr. Goodman could have maintained the herd without the federal aid. He is charged with obtaining the feed for a herd of 780 cows, 165 heifers, 600 calves and 51 bulls in Pinal County, where he operates a ranch.

Production Manager Named by Bemis Bag

SAN FRANCISCO, CAL.—George E. Nelson has been appointed production manager of the Bemis Bro. Bag Co., San Francisco bag manufacturing plant, disclosed L. A. Linville, vice president and director of western operations.

Mr. Linville stated that Mr. Nelson will be placed in charge of all manufacturing, production and office management activities at the San Francisco plant. The plant will move, early this summer, to new facilities in Newark, Cal. He succeeds Frank W. Peters, who has been named facilities engineer.

Mr. Nelson, who has served as production engineer at the company's Seattle bag plant during the past year, joined Bemis in 1948 as a quality control supervisor there. In 1951, he became assistant superintendent and in 1957, plant engineer.

Don't Mix Without Econoferm

(Multiple Cultured Product Absorbed on Soymeal)

Econoferm offers a reliable source of unidentified growth factors to promote faster gains. It is rich in essential known ingredients, including 5 important vitamins.

With Econoferm in your feed you offer your customer, in moisture-resistant 50 lb. bags, a product that has all the benefits of dry fermentation solubles.

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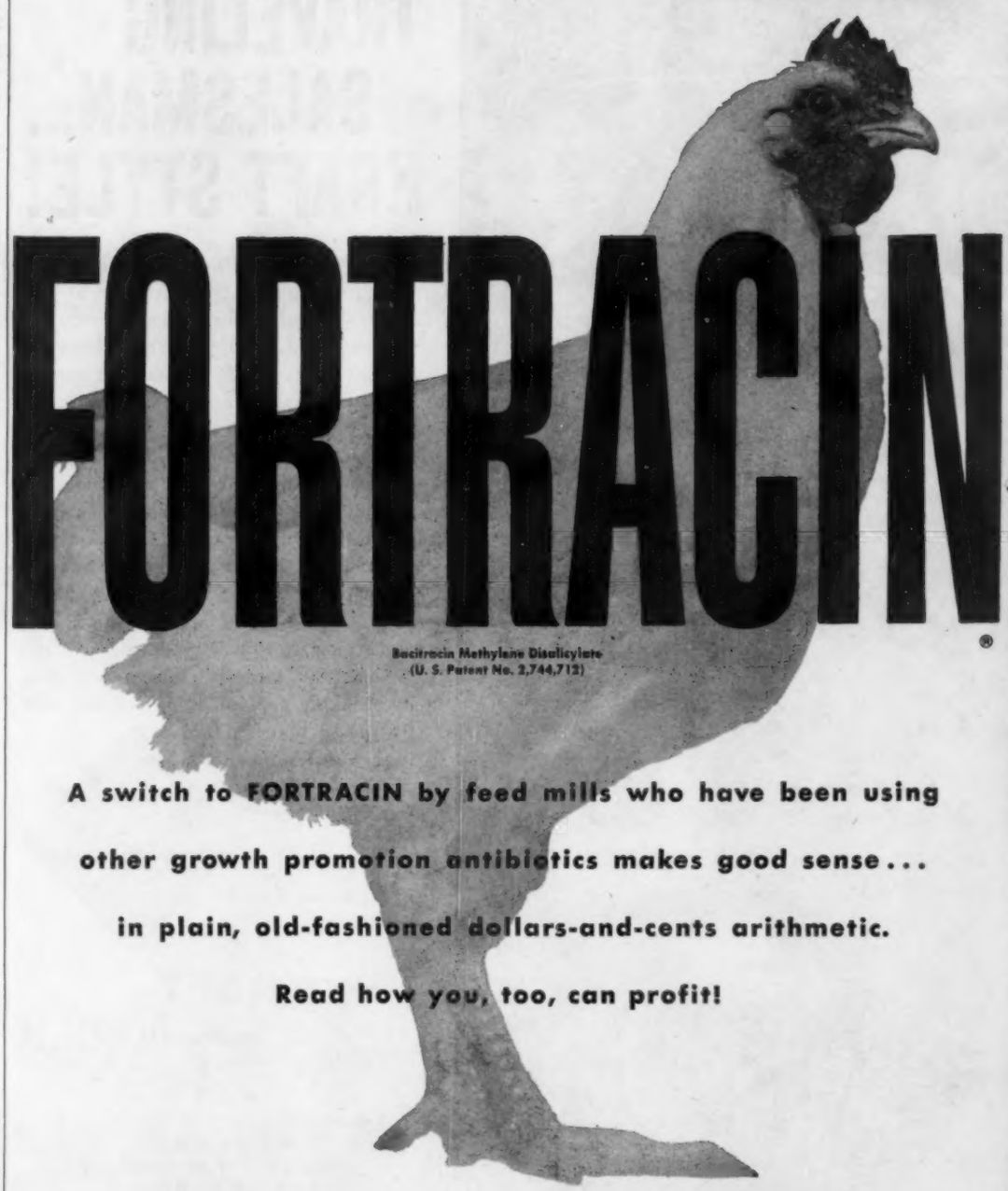

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A switch to FORTRACIN by feed mills who have been using other growth promotion antibiotics makes good sense... in plain, old-fashioned dollars-and-cents arithmetic.

Read how you, too, can profit!

Cattlemen's Association Calls for Industry-Wide Research Conference

DALLAS, TEXAS—Some 40 resolutions were passed at the 63rd annual convention of the American National Cattlemen's Assn. here Jan. 30.

Among the key resolutions were those calling for an industry-wide conference on research and planning for the "improved beef animal" the industry will need to continue to efficiently meet consumer preference.

Another resolution asked the U.S. Department of Agriculture to adopt standards for carcass beef which would identify cut-out yields separate from quality grades.

The group opposed any legislation or regulation which would eliminate direct selling or "any channel of marketing" and which would prohibit the use of "pencil shrink" in direct transactions.

The association urged that adequate funds be provided for the Federal Meat Inspection Service which has long "assured wholesome and safe meat products for the consumer." Recognizing a dramatic increase in the imports of livestock and meat products, the group also requested action leading toward more reasonable limitations on imports.

Called for Research

Several resolutions called for stepped-up research into animal diseases and for use of calfhood vaccination as an alternate in the program of brucellosis eradication. Vaccination would be accepted in recertification and as clearance for interstate shipment under the motion.

The cattlemen reiterated their determination to alter federal regulations to allow for voluntary deductions at posted markets for beef promotion purposes. They opposed legislation which would create a system of "tightly-locked" wilderness areas as "contrary to the multiple-use principle in management of federal lands."

In resolutions dealing with economy in government and federal spending the group urged support for passage of a constitutional amendment which could eventually eliminate federal income taxes. Meanwhile they asked that some types of incomes, particularly those of persons with fluctuating businesses such as agriculture, be "averaged over long periods for income tax purposes."

The group also urged Congress to recognize by specific legislation the historical concept that states have the right to control the water within their boundaries.

Fred H. Dressler, Gardnerville, Nev., was chosen president by the 2,000 delegates from 40 states. Mr. Dressler succeeds G. R. (Jack) Millburn, Grass Range, Mont.

New 1st vice president is Cushman Radebaugh, Orlando and Fort Pierce, Fla. Mr. Radebaugh, who raises Braford cattle, is the first southerner to be elected to the office.

Other officers elected included C. W. McMillan, Denver, Colo., executive vice president, and six 2nd vice presidents: Bern Coulter, Bridgeport, Neb.; John Armstrong, Selma, Ala.; E. S. F. Brainard, Canadian, Texas; Robert Johnson, Sanger, Cal.; Brooks Keogh, Keene, N.D., and J. Wells Robins, Scipio, Utah.

In a revision of the association's constitution and by-laws, six additional men will join the officers in directing affairs of the organization between conventions, replacing the larger executive committee formerly required to act.

Iowa Firm Announces Staff Appointments

CHARLES CITY, IOWA—Appointments to the staff of the Walsh Manufacturing Co. here have been announced.

Robert A. Wolff has been named vice president and general manager; E. L. Barber, general sales manager; Harold C. Mead, plant superintendent; A. F. White, purchasing agent; Don Rawson, sales manager of the building division; Mrs. Esther Erickson, sales promotion, and Mrs. Etta Culbert, bookkeeper.

The firm was purchased by Nixdorff-Krein Manufacturing Co. of St. Louis last August but will continue under its same name. The company is a manufacturer and jobber of farm equipment.

Chase Bag Co. Names Oregon Branch Head

NEW YORK—James W. Wells, Jr., has been named manager of Chase Bag Co.'s Portland, Ore., branch, according to John A. Brewster, vice president and director of west coast operations.

J. W. Wells, Jr.

After graduation from the University of Oregon, Mr. Wells joined the firm when its Portland plant began operations in 1939. He traveled the Oregon territory until 1948 when he was appointed sales manager.

The firm also operates a branch in Los Angeles and a sales division in San Francisco.

LIQUID FEED FIRM

ALPINE, TEXAS — Boreing Feed Service Co. has recently been established by Charlie Boering of Roswell, N.M. The firm will handle Morea liquid feed and will supply a ranching area that takes in several counties. Mr. Boering was formerly manager of the J. P. White Industries feed mill at Roswell for 15 years.

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FIRST, FORTRACIN COSTS LESS!

Supplying antibiotics in bulk has long been big business with Penick. Experience, thoroughly modern equipment and efficient production procedures enable us to produce FORTRACIN profitably . . . *at an attractive price to you!*

That's why FORTRACIN costs you substantially less than other salts of bacitracin.

SECOND, FORTRACIN MEANS BETTER FEED CONVERSION!

Tests with broilers indicate superior growth promotion and significantly higher feed efficiency for FORTRACIN as compared with penicillin and other forms of bacitracin. Optimum results are obtained at economical levels of 4 grams per ton.

THIRD, FORTRACIN IS STABLE WHEN PELLETED!

Not only stable in storage (for five years), FORTRACIN is stable where it counts . . . losing less than 4% when pelleted as proved in tests by Wisconsin Alumni Research Foundation. That means less need for costly overages, additional economies for feed formulators.

FOURTH, FORTRACIN OFFERS $5,000 "DOLLARS-FOR-DATA"!

We know FORTRACIN is the most economical growth promotion antibiotic available. We want you to know it, too . . . so we'll pay you to prove it to yourself! Penick will pay . . . substantially and in cash . . . for reports on results on flocks fed FORTRACIN-containing diets. All we require is a simple transcript of routine records you already keep. Use the coupon below to get full details.

AMPLE STOCKS AVAILABLE IN THE FORM YOU PREFER

We provide FORTRACIN in concentrations of 10, 25 and 100 gram activity per pound.

If you prefer a pre-mix, we can recommend suppliers of FORTRACIN formulations.

We can also supply FORTRACIN-with-penicillin for feed mills who want to use them in combination and do not want to do their own mixing.

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For price list, test reports and details of our "Dollars-for-Data" program.

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Gentlemen: Please send

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Long an Industry Leader, 'the Boss' Of the 'Alumni Association' Nears 80

What kind of a man does it take to influence the lives of a group of young men to such an extent that they spontaneously create in his honor an "alumni association" to perpetuate the memory of his leadership in the feed industry?

Answering this question is easy for a Harold Arthur Abbott alumnus. It takes a man with:

"A very early and very broad vision of what the feed industry could accomplish.

"A strong sense of duty in serving the public.

"Unwavering honesty in all dealings, resulting in highest standards of quality and service to the people who were his customers and adherence to highest ethical principles.

"A goal of perfection in his demand of himself and of those associated with him."

This definition of "The Boss" comes from Walter N. Jones of Sawyer, Mich., after more than 20 years have passed since he and 20 or so other men trained under the guidance of Mr. Abbott formed the informal organization they call the Abbott Alumni in August, 1939, at a meeting of the National Baby Chick Assn. in Cleveland, Ohio. Those "Abbott educated" men still demonstrate their continued loyalty to their teacher by getting together every year as Abbott Alumni.

Those identified as other Abbott "graduates" include Ralph Holder, Lyman Peck, Jerry Spahr, Harry Herron, Lyman Marsh, Bill Anderson, George Harris, John Bullard, Howard McPherson, Tom Wilkinson, Harold Grassl, Bep Geasey, Carl Zehr, Carl Anderson and Cecil Marsh.

They pay tribute to a man who is more than a man. Mr. Abbott is an institution whose knowledge of the feed industry and related fields dates back long before the first annual meeting of the American Feed Manufacturers Assn. was held in 1909.

Mr. Abbott, who'll be 80 years old May 2, pioneered the manufacture of commercial poultry feeds in 1903. He was with the Albert Dickinson Co. of Chicago from 1898 to 1934, rising through the ranks to vice president in charge of the feed division. For more than 20 years he was manager of the soybean division of Funk Bros. Seed Co., Bloomington, Ill., a position he held until his recent retirement.

That's just skimming his career. He was a pioneer with AFMA, too. He contributed greatly to the launching of AFMA as a founding member. For some 30 years he continuously served AFMA as an officer, as a member of the executive committee or as a director. He was elected to the presidency of the association in May, 1918, again in 1919 and a third time in 1932, which is a distinctive record because Mr. Abbott is the only man who ever served two separate terms as AFMA president (now called chairman).

Mr. Abbott served as a director of the National Soybean Processors Assn., Chicago, 1943 through 1948, and during several of those years was also on NSPA's executive committee. From 1951 through 1959 he served as NSPA treasurer, and also as a member of the executive committee. During World War I he represented the poultry feed industry in the National Food Administration.

"The Boss"

Alumni of the Abbott "school for feed men," many other friends and even Mrs. Abbott call Harold "The Boss."

Back in 1898 before Mr. Abbott had acquired that title he started work for Albert Dickinson Co. Five years later he established a formula feed department for the company.

Of those early days of decision, Harold says, "The ever expanding demand for better feed ingredients so impressed itself upon my young mind that, after due consultation with some of the more mature and experienced associates with the firm, it led to the suggestion we manufacture and market a feed mixture of our formulation under a distinctive brand name."

That "distinctive brand" was Globe. With Harold at the helm, a full line of Globe poultry rations was put on the market. Later, dairy, hog, horse, pigeon, rabbit and dog feeds were added. Complete rations and protein concentrates were widely distributed from the Missouri River to the Atlantic Coast with large production mills in Chicago and Minneapolis.

Now, approaching his 80th birthday, Mr. Abbott is in retirement in Winter Haven, Fla., and proud of having had a part in the "bringing up" of the feed industry.

Harold Abbott

Tallow Output May Set Record This Year

WASHINGTON—Output of inedible tallow and greases for the entire 1959-60 marketing year is expected to total 3,400 million pounds, about 6% more than the 3,198 million last year and the previous peak of 3,215 million in 1955-56, the U.S. Department of Agriculture says.

Domestic use is expected to remain about the same as in recent years, but exports may climb to a record, the Agricultural Marketing Service notes in a Fats and Oils Situation report. Domestic use is expected to total about 1.8 billion pounds. Lower prices and availability of record supplies during the current marketing year help to improve the U.S. competitive position in the world tallow market. Exports may climb to 1.6 billion pounds. The previous export peak of 1.5 billion pounds was reached in 1955-56.

Were it not for the record export expectation, tallow prices would be under even more pressure, because of the prospect for little change in domestic consumption. The U.S. produces about half of the world's tallow and greases and accounts for about two thirds of world trade.

Under the pressure of the heavy output, prices of inedible tallow and greases have declined about 1¢ per pound since the beginning of the 1959-60 marketing year.

Total disappearance kept pace with increased production during October-November, 1959, so there has been no further buildup in stocks. Domestic disappearance was slightly less than in 1958, while exports rose to a new high. Compared with a year earlier, stocks of inedible tallow and greases on Dec. 1, 1959, at 327 million pounds, were up about 75 million pounds.

CORN PRODUCTION

ATHENS, GA. — Corn represents 30% of the total crop production income in Georgia, according to agronomists at the University of Georgia.

FORTIFIED
FISH SOLUBLES
WITH MINIMUM 25% FISH GLANDULAR AND LIVER HYDROLYSATE ADDED
+ the Plus Factors
Guaranteed Yearly Supply—*As Needed*
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GIVE YOUR FERTILIZER CUSTOMERS WHAT They WANT
. . . A GUARANTEED EVEN, ACCURATE SPREAD — FULL WIDTH, NO SKIPS

SPREAD IS CHECKED THE FULL WIDTH BY ACTUAL WEIGHT

The Simonsen spreader is not an adaptation of a lime spreader. It is designed to spread high analysis fertilizers accurately and evenly, down to 75 lbs. per acre. Superb performance results in positive customer satisfaction, and unequalled maintenance-free operation. Leasing plans available.

GET THE TROUBLE-FREE FEATURES *YOU* WANT

- Non-Corroding stainless steel at all critical points—apron, metering gate and guides, take-up bolts, drive chains.
- All-weather wheel drive assembly.
- Hydraulic fan drive.
- Outside compartment door hinges.
- Simple adjustment for spreading rate.
- Rubber shock absorbers on hoods.

WRITE, WIRE OR PHONE COLLECT
for further information about the R710, plus a full line of other Simonsen bulk fertilizer bodies and the new Simonsen Feedilizer (a dual-purpose bulk feed and bulk fertilizer body).

SIMONSEN ALSO MAKES A FULL LINE OF BULK FEED BODIES, COMBINATION BULK FEED AND SACK BODIES, AND UNLOADERS TO FIT YOUR PRESENT TRUCK BODY.

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The Three Puritans symbolize the three CCC quarries—in Quincy, Illinois, Carthage, Missouri and Weeping Water, Nebraska—so called because of the high purity of the deposits.
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New Process Hetrogen K

(MENADIONE SODIUM BISULFITE)

Premix*

STABILITY

98%

POTENCY RETAINED

Ordinary Vitamin K Premix

STABILITY

70%

POTENCY RETAINED

These astounding figures represent the result of years of research and experimentation by the Heterochemical Corporation to develop and perfect a new method of preparing vitamin K premixes. This assures maximum stability under the most adverse conditions of temperature and humidity. Success has been achieved, and there is now available to the feed industry, at no increase in price, a vitamin K premix they can use with the utmost confidence. With New Process HETROGEN K *the potency in the bag matches the potency on the tag,* whatever the storage circumstances. This high stability is proven by the test data summarized below:

STABILITY— normal storage conditions— 4 gm premix at average room temperature and humidity

	% Potency Retained		
Avg of 3 lots	**30 Days**	**90 Days**	**120 Days**
New Process Hetrogen K Premix	99%	98%	99%
Ordinary Vitamin K Premix	84%	67%	52%

STABILITY— field samples—ordinary vitamin K premix recently secured from feed mills

	% Potency Retained
Average of 7 lots	23%

(Actual potency of individual lots ranged from 0 to 45%)

STABILITY— adverse storage conditions— accelerated storage conditions 113°F at 80% relative humidity

	% Potency Retained after 30 Days	
Premix Potency	**Old Style Premix**	**New Process Hetrogen K**
16 gm/lb	49	91
8	27	92
4	39	91

The development of New Process HETROGEN K represents the only real improvement in Vitamin K premixes which has occurred since 1954. For feed manufacturers this new HETROGEN K premix means a reduction in vitamin K fortification costs, elimination of extra overfill, no storage loss and better purchasing position. You can now buy larger quantities at a price advantage, and have complete assurance that you have a product whose potency is reliable and stable, month after month.

Prices of New Process HETROGEN K premix are competitive with ordinary Vitamin K. There is no extra charge for this improved product. A range of graduated potencies from 4 to 64 grams per pound on easy mixing calcite or edible soymeal carrier are available. Let us tell you more about this superior vitamin K premix. Write or phone for full information on New Process HETROGEN K.

*patents pending

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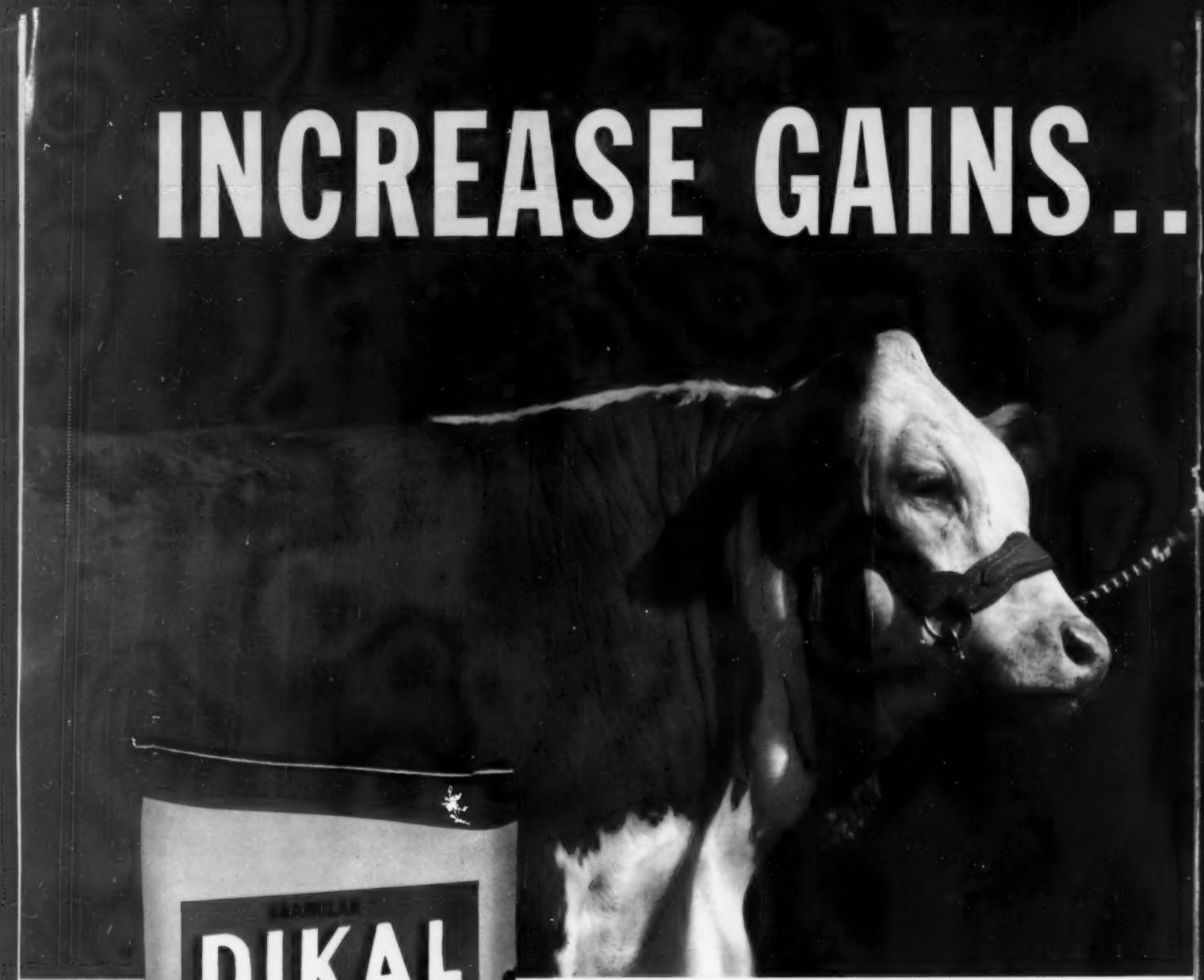

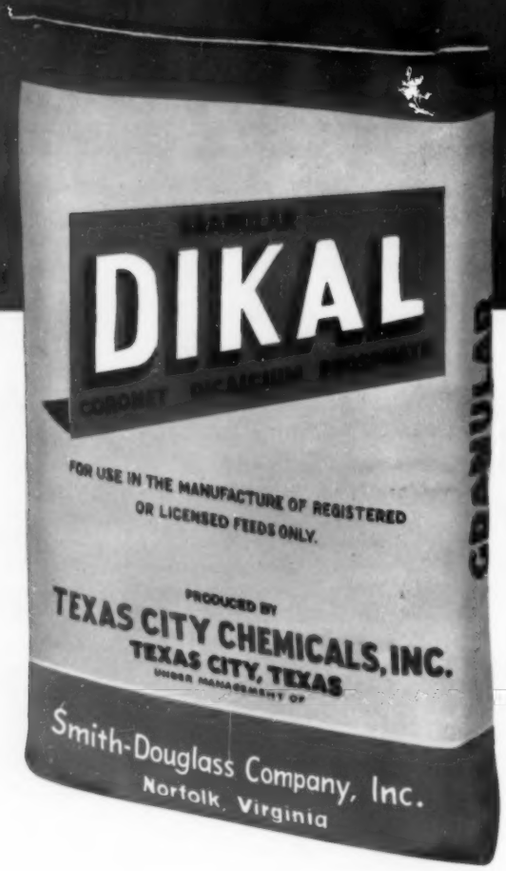

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CORONET GRANULAR DIKAL is backed by 50 years of RESEARCH which delivers an increasingly BETTER PRODUCT . . . year after year!

GUARANTEED UNIFORM ANALYSIS

Phosphorus	Calcium	Fluorine
18.5% min.	21.0% min. 24.0% max.	0.12% max.

Screen Analysis: All through 20 mesh; 80% to 90% on 200 mesh.

use higher dicalcium phosphate levels

FEEDING TRIALS PROVE BENEFITS

Rations supplemented with higher dicalcium phosphate levels produced faster liveweight gains and more efficient feed utilization in a series of cattle feeding tests at State Agricultural Experiment Stations.

IOWA STATE[1]

Tests conducted by Iowa State College researchers indicate cattle receiving higher dicalcium phosphate rations graded higher at slaughter and returned greater margins over feed costs. The Iowa State report concludes . . . in some cases a higher level of total ration phosphorus, possibly as high as 0.3 percent, may well be needed.

PURDUE[2]

According to a study conducted by Purdue University researchers, raising the phosphorus level in a corn-soy ration from 0.30 to 0.45 per cent improved rate of gain 29% and feed efficiency 6.6% when fed to growing swine on ladino pasture. A further increase in phosphorus to 0.60% improved feed efficiency 5.7%, but failed to stimulate gains further.

Several pigs on the corn-soy basal ration exhibited borderline phosphorus deficiency symptoms.

SOUTH CAROLINA[3]

An animal deficient in phosphorus from either hereditary genetic defects, or because of prior consumption of a low phosphorus ration may bloat, regardless of the level of nutrition in the feed crop. Therefore, a critical phosphorus deficiency in ruminants should be corrected through feeding of dicalcium phosphate or other mineral phosphates or by feeding high phosphorus concentrated feeds prior to being placed on luscious legume pastures.

TEXAS[4]

In feeding trials on the King Ranch in Texas, cows fed supplemental phosphorus weaned 39% more calves, averaging 50 pounds more weight per calf. In addition, feed lot operators in the Southwest have discovered that higher phosphorus levels result in faster gains.

USE MORE CORONET GRANULAR DIKAL IN YOUR FEEDS

1. Different Kinds and Amounts of Phosphorus in Fattening Cattle Rations. Agricultural Extension Service A. H. Leaflet 209. Iowa State College. Wise Burroughs, Arthur Raun, Edmund Cheng, C. C. Culbertson.
2. Phosphorus and Protein Levels for Growing-Finishing Swine on Legume Pasture. A. H. 215. Purdue University. C. E. Jordan, J. H. Conrad, M. P. Plumlee, W. M. Beeson.
3. Relation of Phosphorus Deficiency to Acute Bloat in Ruminants. H. P. Cooper, 69th Annual Report South Carolina Agricultural Experiment Station, Clemson, S. C., May, 1957.
4. Methods of Supplying Phosphorus to Range Cattle in South Texas. Texas Agricultural Experiment Station Bulletin 773. E. B. Reynolds, J. M. Jones, H. H. Jones, J. F. Fudge and R. J. Kleberg, Jr.

QUALITY **SERVICE** **DUST-FREE**

CORONET GRANULAR DIKAL, produced under meticulous and carefully controlled manufacturing conditions at this modern facility in Texas City, Texas . . . is a highly available source of phosphorus.

CORONET GRANULAR DIKAL assures a constant supply when you want it . . . in any desired quantity. Feed manufacturers enjoy faster, more dependable service from Texas City.

CORONET GRANULAR DIKAL eliminates annoying dust in bagged or bulk shipments. Additionally, Granular Dikal improves dispersion because of similarity in particle size to other feed components.

LET US FIGURE THE COST OF DIKAL DELIVERED TO YOUR PLANT

DIKAL

A PRODUCT OF THE

SMITH-DOUGLASS

COMPANY, INCORPORATED • NORFOLK 1, VIRGINIA

Colleges Prepare Check List for Egg Production, Pullet-Growing Contracts

URBANA, ILL.—A check list for farmers to use before signing an egg production or pullet-growing contract has been prepared by the University of Illinois in cooperation with representatives of Michigan State University, Ohio State University and Purdue University.

Illinois authors of the check list are Dr. J. R. Roush, marketing division, department of agricultural economics; S. F. Ridlen, poultry division, department of animal science, and N. G. P. Krausz, agricultural law division, department of agricultural economics.

Here are the questions which farmers are advised to consider:

1. Does the Contract Cover a Specific Period?

2. Is Renewal Automatic Unless Advance Notice of Termination Is Given?

3. What Are the Cancellation Provisions?

a. Are there cancellation provisions for both parties?
b. What happens in case of death or illness?
c. Does either party have the right to sell or assign the contract?
d. What happens in case the birds are destroyed by fire, flood, or lightning?
e. Can the contract be cancelled in case of unprofitable operations?
f. Can it be cancelled for non-compliance?

4. Are the Contracting Parties Clearly Identified?

a. Who can represent the company?
b. Do both husband and wife have to sign the contract?
c. Is the landlord (or tenant) required to sign?

5. What Is the Legal Relationship of the Parties?

a. Is this a joint venture or a partnership?
b. Are the parties independent contractors?
c. Is the producer an employee or agent of the integrator?
d. Is it a creditor and debtor relationship?
   (1) Is the debt secured?
   (2) How is the debt secured?

6. What Is the Legal Status of the Contract?

a. Has the contract been checked by your lawyer?
b. Is it signed by authorized persons?
c. Has it been witnessed or notarized and recorded? (Not legally required but desirable.)

7. Are There Provisions for Arbitration?

a. When can arbitration be used?
b. Can arbitration be called for by either party?
c. How are the arbitrators selected?
d. How many arbitrators are there?
e. Is the report of the arbitrators binding?
f. Who pays the cost of arbitration?

8. What Are the Provisions Concerning Non-Conformance?

a. What constitutes non-conformance?
b. Can court action be taken in case of non-conformance?
c. What is the penalty for non-conformance?
d. Can the contract be continued by corrective action?

9. How Is Payment Made to the Producer?

a. How is payment determined?
b. When is it paid?
c. Is it paid in cash?
d. Is there a profit-sharing program?
   (1) How is it figured?
   (2) Is there likely to be any profit sharing?
e. Are bonuses paid for production efficiencies?
   (1) High egg production?
   (2) High livability?
   (3) Good feed conversion?
   (4) Others?

10. Who Supplies the Following Items and at What Prices?

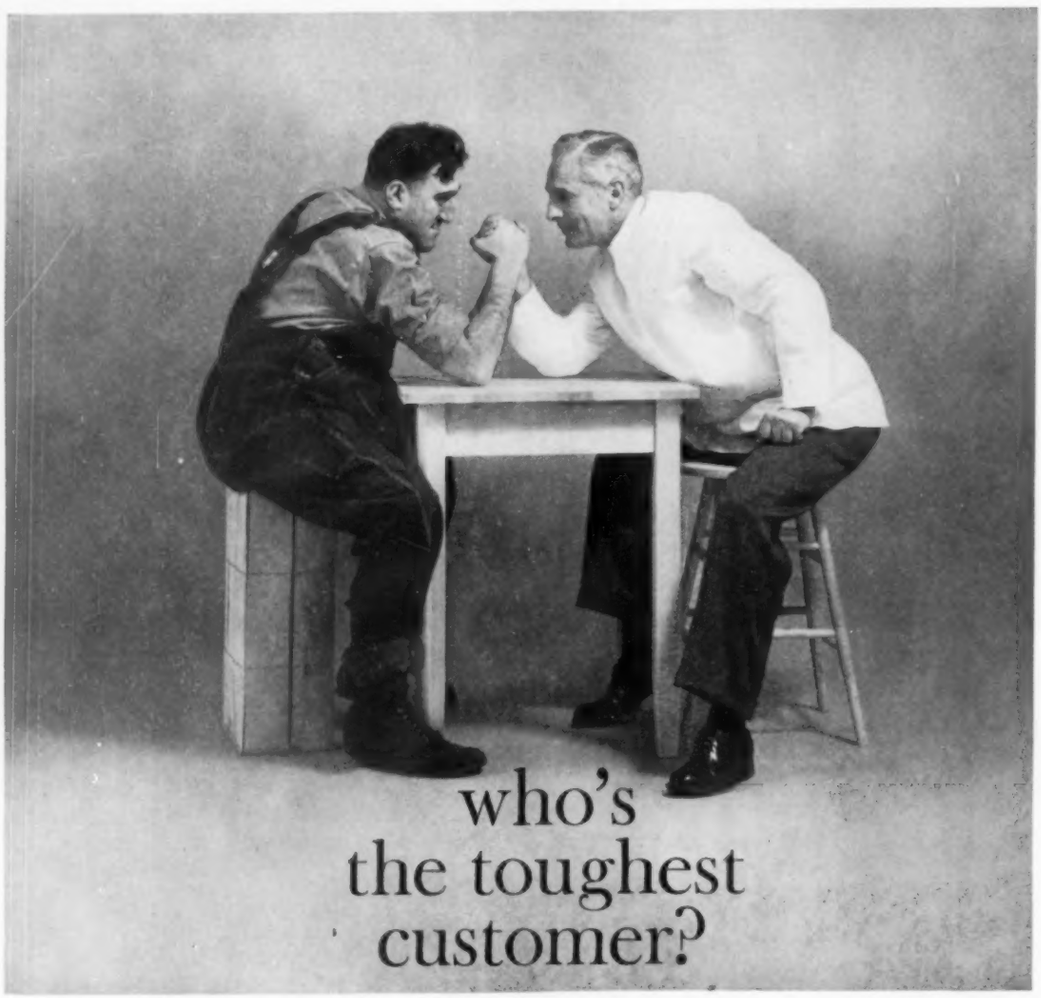
a. Feed
b. Birds
   (1) Age
   (2) Strain
c. Medicinals
d. Veterinary services
e. Litter
f. Housing
g. Equipment
h. Labor
i. Nesting material (applies to egg contracts only)
j. Detergent-sanitizer (applies to egg contracts only)
k. Shell-treating oil (applies to egg contracts only)
l. Supervision
m. Utilities
   (1) Heat
   (2) Lights
   (3) Water
n. Egg cases (applies to egg contracts only)
o. Finances
p. Transportation
   (1) Birds
   (2) Feed
   (3) Eggs (applies to egg contracts only)
q. Insurance premiums
   (1) Birds
   (2) Building
   (3) Equipment
   (4) Feed
r. Tax payments
   (1) Real estate
   (2) Personal property
   (3) Income
   (4) Sales

11. Who Owns the Following Items?

a. Manure
b. Feed bags
c. Eggs (applies to egg contracts only)
d. Cull birds

12. What Is the Management Program?

a. What is the prescribed minimum flock size?
b. What is the feeding program?
   (1) What feeding method will be used?
   (2) May home-grown grains be used?
   (3) Must only one brand of feed be fed?
   (4) What feed additives will be used?
c. What type of housing is required?
d. Are the birds to be kept on litter, on slats or in cages?
e. Is the type of nest specified?
f. How much waterer, feeder and

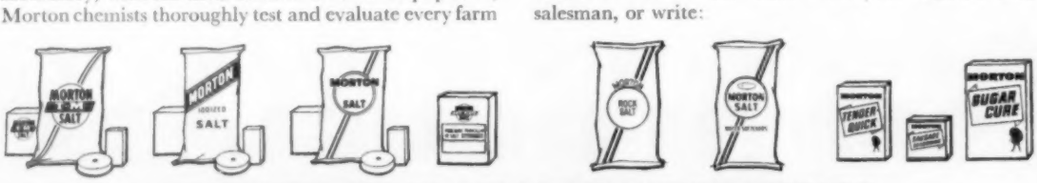


When it comes to Morton agricultural products, the man in the white coat wins hands down. For he's one of the chemists in the Nutritional Research Department at Morton's ultra-modern research laboratory. Before any Morton agricultural product can be put on the market it must pass the rigid standards of quality set up by the Morton chemists, and they are the toughest!

Working in the world's most complete salt research laboratory, with the most modern scientific equipment, Morton chemists thoroughly test and evaluate every farm and ranch product carrying the famous Morton name.

Every product must meet strict quality specifications. It must never vary in content analysis. It must give maximum performance at all times. And it must be the best possible product made at a given fair price.

This is why you can sell Morton Salt products with complete confidence. They also are profitable items with strong consumer acceptance that helps make them easy to sell. You can order them from your Morton Salt salesman, or write:



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NUTRITIONAL RESEARCH DEPARTMENT
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floor space is required per bird?
g. Are the birds debeaked, dubbed and/or dewinged and, if so, when?
h. What is the lighting schedule?
i. What is the replacement program?
j. Must all birds on the farm be the same age?
k. Must different-aged birds be separated?
l. What is the sanitation program?
m. Are visitors prohibited in the poultry area?
n. What is the vaccination and medication program?
o. Who maintains the records?
(1) Are they detailed?
(2) Are they available to both parties?
p. Does the integrator supervise the program?
q. How are the eggs to be handled (applies to egg contracts only)
(1) How often must eggs be gathered?
(2) What cleaning method is required?
(3) At what temperature and humidity must eggs be held?
(4) Must they be graded on the farm?

13. What Is the Marketing Program?

a. Is a specific market designated?
b. Who decides when to market?
c. Are sales to be made on a graded basis?
d. How is price determined?
e. Is grower required to furnish labor for moving birds?
f. Who decides which birds are culls?
g. How is the producer paid for undergrade eggs and/or birds?
h. Are home consumption and retail sales limited or prohibited?
i. Who stands the loss of excessive mortality or low egg quality?

Book on Veterinary Drugs Published

NEW YORK—The Springer Publishing Co., Inc., has published a pocket-size dictionary called "Veterinary Drugs in Current Use" by Dr. Rudolph Seiden.

The new book is designed for on-the-job use of veterinarians, veterinary druggists, farmers, county agents and vocational agriculture teachers, the company said.

It contains information on 600 veterinary drugs—their physical and chemical properties, therapeutic uses, side effects and dangers, antidotes and doses for the various animal species. It also lists pharmacologic groups of drugs, trade names and synonyms of the drugs, all animal diseases for which the drugs are recommended and many health terms. A total of over 1,800 alphabetical entries is fully cross-referenced.

The author is Rudolph Seiden, D.Sc., consultant on veterinary pharmaceuticals, Kansas City. He has written several other books, including "Handbook of Feedstuffs" (with Prof. W. H. Pfander), "Livestock Health Encyclopedia" and "Poultry Handbook."

In collecting and coordinating the facts, recommendations and warnings for "Veterinary Drugs in Current Use," Dr. Seiden has drawn on many official and standard works and, in case of conflicting sources, has independently evaluated the drugs. It is 128 pages, in flexible cover, and costs $2.25.

Additional information may be obtained from Springer Publishing Co., Inc., 44 East 23rd St., New York 10.

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Industrial Power Cost Guide Is Published

NEW YORK — An engineering guide to lower power costs, "Electrical Efficiency in Industrial Plants," has been published by F. W. Dodge Corp., New York.

The book, written by Edwin S. Lincoln, veteran electrical consultant and author, deals with the problems of reducing electric power and lighting costs in industrial plants and larger commercial buildings.

A copy of the 235-page book on "Electrical Efficiency in Industrial Plants," is available for $9.50 by writing to Willis R. Inman, Jr., 119 W. 40th St., New York 18.

FIRE DESTROYS MILL

PRESTON, MINN.—Fire completely destroyed the Bristol Center Mill & Feed Store owned by Lowell Silkkink.

PLANT EXPANSION—Currently under construction is this new addition at the southern plant of Screw Conveyor Corp. at Winona, Miss. The addition comprises 45,000 sq. ft. indicated by the circled section in the birds-eye view above. It consists of a group of masonry buildings which will house enlarged structural fabricating departments. This is designed to permit greater flexibility in the manufacture of Kewanee hydraulic truck dumpers and increase, as well, the production of screw conveyors, troughing, "Hammond" and "Winona" elevator buckets, screw-lifts, Super-Flo conveyor and other fabricated products. The new addition will bring the total manufacturing area of the plant to about 145,000 sq. ft.

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FEED DEALERS OWNING DAFFINS BUY ONE OF EVERY FOUR SOLD!

A typical fleet of Daffin Feedmobiles. These are operated by Edwin D. Smell, of Route 3, Uniontown, Pennsylvania.

Feedmen operating Daffins are earning today's top merchandising profits. They've learned to know *a good thing*—and when they expand operations, you can bet they buy "another Daffin!"

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First North Carolina Feed Conference Held for Veterinarians, Service Men

By Special Correspondent

RALEIGH, N.C.—The first North Carolina conference for veterinarians and field service men of the feed industry was conducted recently on the campus of North Carolina State College.

Approximately 125 field service men and 100 veterinarians discussed teamwork and some of their mutual problems.

Presiding over the opening session were Dr. C. R. Swearington, president of the North Carolina State Veterinary Medicine Assn., Farmville, and A. G. Martin of Sanford, president of the North Carolina Feed Manufacturers Assn. These two associations sponsored the program conducted by the state college departments of poultry and animal industry.

Dr. R. L. Lovvorn, director of research for the State College School of Agriculture, opened the meeting with a discussion of teamwork in agriculture. He traced the history of the beginning of the land grant college and the U.S. Department of Agriculture, both having their founding less than 100 years ago.

Working Relations

Dr. R. C. Klussendorf, Commercial Solvents Corp., Terre Haute, Ind., continued the discussion with his talk, "Working Relations Between Practicing Veterinarians and Feed Manufacturers."

Commenting on the large areas of mutual interest, Dr. Klussendorf stated that both groups have the animal owner as their only client and customer.

"They both stay in business," he continued, "by helping the animal owner maintain his livestock in a state of productive health, and they go out of business when the animals disappear."

Dr. Klussendorf said that there are comparatively few clashes between the two groups but that these clashes are widely and loudly publicized.

He urged better relations by getting better acquainted—and doing this before a controversy arises.

"Friendly relations," he added, "already exist between the American Veterinary Medical Assn., American Feed Manufacturers Assn., and the American Association of Veterinary Nutritionists. They also exist at the state level in a growing number of states."

He concluded that, at the local level, friendly relations can only be developed through the efforts of individuals—no organization can accomplish this. Veterinarians and feed dealers should be able to work together in rendering service to livestock owners.

Dr. Klussendorf also presented a paper, "Stress, Disease and Medicated Feed."

He began with the comment that medicated feed has become the topic of much discussion and deep concern.

"Practically everyone admits that medicated feeds are here to stay," he said, "so we must learn to understand them, and make plans to use them effectively."

"The first, and probably the greatest, stumbling block lies in finding a suitable place to draw a line between a feed additive and a therapeutic drug, or between a growth-promoting supplement and a medicated feed. The veterinarian and the feed manufacturer are disposed to disagree on where this line should be drawn."

The Food & Drug Administration of the U.S. Department of Health, Education & Welfare recognizes and approves 5 "Certifiable Antibiotics," 8 "New Drugs," 32 "Not New Drugs," and more than 100 "Food Chemicals," he said.

Dr. Klussendorf said, "Feed medication came as a companion to formulated feed—a specialized feed for every purpose. Once the livestock owner has been educated to accept specialized feeds, why not one for disease prevention and for treatment? Such use in a poultry flock became 'preventive feeding' when used while only a few birds were recognizably sick.

"Once adapted to this use, variations and wider fields developed rapidly. And therein lies the problem," he said.

Feed Additives

The major topic for the conference covered the feed additive problem.

Dr. W. E. Thomas, State College dairy husbandry section, reported on evidence for and against the use of feed additives in livestock and poultry rations.

"The known nutritional requirements of animals," said Dr. Thomas, "have not changed appreciably since 1950. A multitude of new feed additives, however, have been offered the feed industry during the past 10 years. Like our missile programs, some of these additives hit the target, some miss, and some blow up in our face—they all make a big splash in the news reports."

Basically, he stated, the feed additives may be for one or more of these purposes: (1) To serve as a source of a required nutrient, (2) to aid in feed conversion, increase rate of gain, increase appetite or increase digesti-

NEW FEED PHOSPHATE PLANT—This is an aerial view of the plant of the newly-formed Rocky Mountain Phosphates, Inc., in Butte, Mont., which will produce defluorinated phosphate. The plant has a scheduled capacity of 60,000 tons per year.

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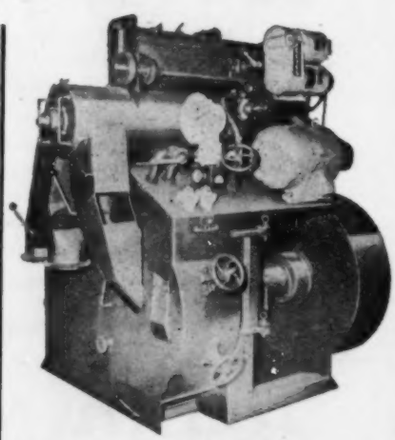

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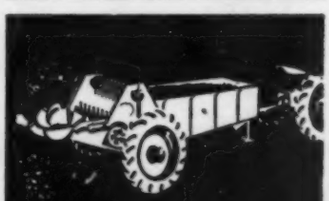

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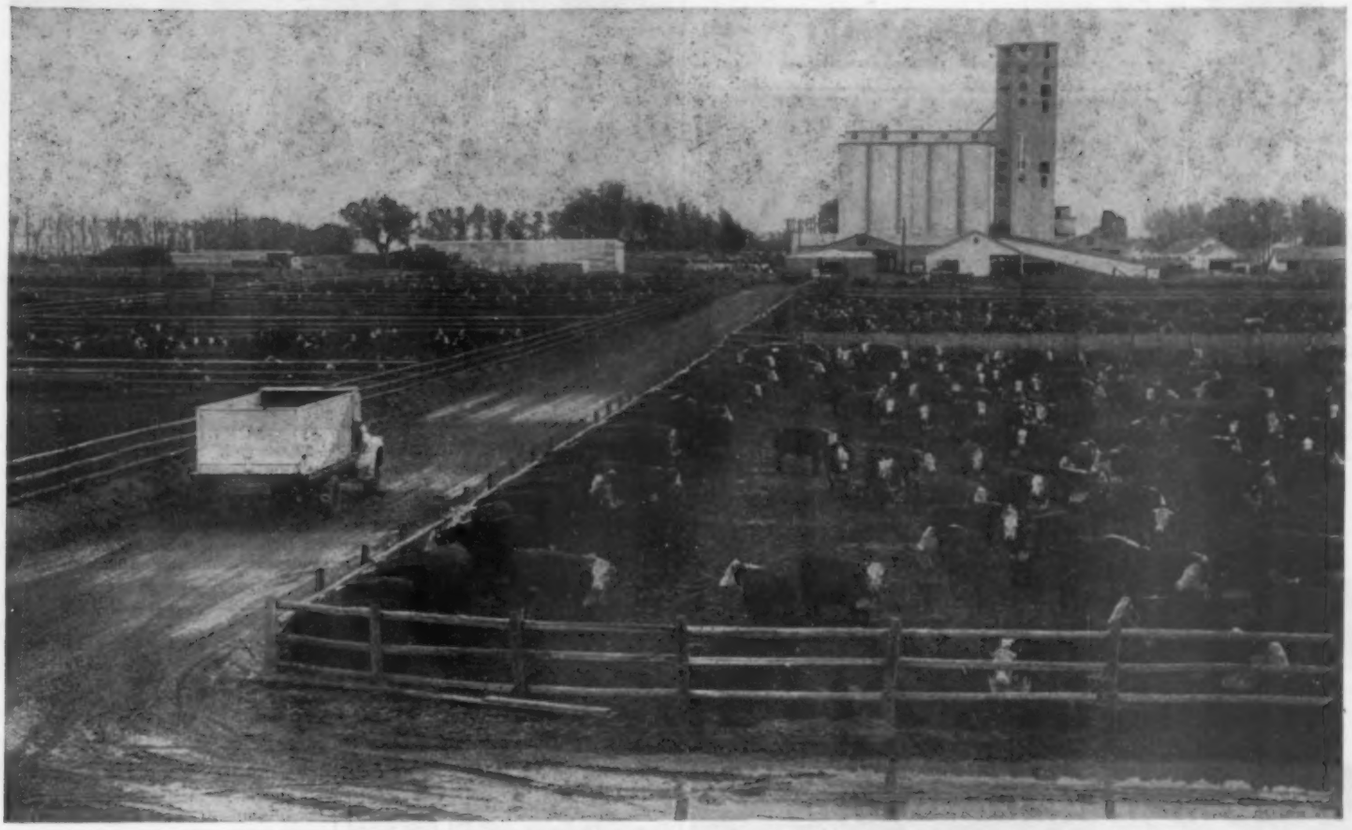

More than 200,000 Stilbosol-fed cattle have been marketed from these giant lots in Greeley, Colorado, since the Monforts first started feeding the new gain-booster in the fall of 1955. About 70% of the cattle are steers and 30% heifers. They are fed Stilbosol rations every day up to 48 hours before marketing.

Giant feedlot cuts costs 10% on steers, 5% on heifers with Stilbosol

"We feed a high-grade roughage-type ration and keep accurate feed intake and gain records on every pen," explains young Kenneth Monfort. "We've run numerous feed tests and have never had any negative results."

by Eugene S. Hahnel

With yearling steers fed 170 days, the Monforts count on at least 2½ lbs. daily gain from ranch to stockyards, including both shrinks. They feed yearling heifers about 130 days for a minimum 2.2 lbs. daily gain.

This photograph, taken from the top of the 500,000-bushel-capacity elevator, shows one of the two huge pit silos that provide a total capacity of 40,000 tons. "Stilbosol is simple to use in our highly mechanized feeding operations," says Kenneth Monfort. "We use Stilbosol for the same reason as everyone else . . . more high-quality beef at less cost. You don't need other reasons."

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THE MONFORTS, GREELEY, COLORADO

Kenneth Monfort (left) and father, Warren, report excellent results after using Stilbosol on almost a quarter of a million cattle. They rely on supplements with Stilbosol to . . .

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3. **Produce more high-quality beef at less cost.**

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ELEVATOR CLINIC INSTRUCTORS—These four men were among the instructors at the business clinic for elevator managers at Michigan State University (left to right): Judson Perkins, director of public relations, General Telephone Co., Muskegon, Mich.; Dr. Richard Phillips, department of agricultural economics and rural sociology, Iowa State University; John Rawlings, director of management service, Illinois Farm Supply Co., and Dr. Carleton C. Dennis, department of agricultural economics, Michigan State University.

bility, or (3) to improve the general health of the animal.

According to Dr. Thomas, one should consider the purpose for which an additive is to be fed and the purpose for which the animal will be used before trying it in feeds. He said some of the factors to be considered include: (1) Safety of human food, (2) adverse side effects on breeding animals, and (3) long range effects on adaptation to disease resistance and immunity.

Dr. Thomas presented his own report on additives for dairy cattle feeds as well as Dr. J. W. Kelly's paper on drug additives for poultry rations and Dr. A. J. Clawson's summary of feed additives for swine.

Dr. Thomas reported that Aureomycin and Terramycin stimulate the growth of calves 10-30% during the first 16 weeks of age. It appears that in addition to the growth response, there is less scours, greater feed consumption, more efficient gains and lower mortality.

Indications, he reported, are that 15-20 mg. of Aureomycin per 100 lb. of body weight daily gives a good response.

There is very little reason to feed antibiotics to dairy calves after they are 12-16 weeks old, he added.

Dr. Thomas stated, "Research on feeding antibiotics to healthy lactating cows appears to show no effect on milk production or general health. Stilbestrol feeding of dairy animals is not recommended because of the possible adverse side effects on reproduction.

"Research results have shown no advantage in feeding ethanol to dairy heifers over an isocaloric amount of starch, and bacteria or bacteria stimulants are not too promising as additives," he said. He also reported that trace mineral feeding is "extremely controversial."

He said, "It is questionable if cattle should be forced to eat additional trace elements mixed with the minerals consumed in large quantities. A possible solution is to offer plain calcium, phosphorus, and common salt free choice and then make element treated minerals available in addition."

Dr. Thomas stated that the tranquilizer hydroxyzine has been fed to milking cows with no effect on milk production, fat production, body weight or feed consumption.

Poultry Rations

Dr. Kelly, department of poultry science, reported that extensive research has been conducted on poultry rations to ascertain the effects of antibiotics on growth, egg production and feed conversion.

He concluded, "Since the degree of effectiveness of an antibiotic as a feed supplement appears conditioned upon many factors, such as level of drug, disease level, stresses and flock management, there is no assurance of positive results by simply including a drug or combination of drugs in different types of poultry rations. Many, if not all, of our antibiotic manufacturers have recognized this fact.

"Programs have been developed by these manufacturers indicating the level of drug efficiency on production.

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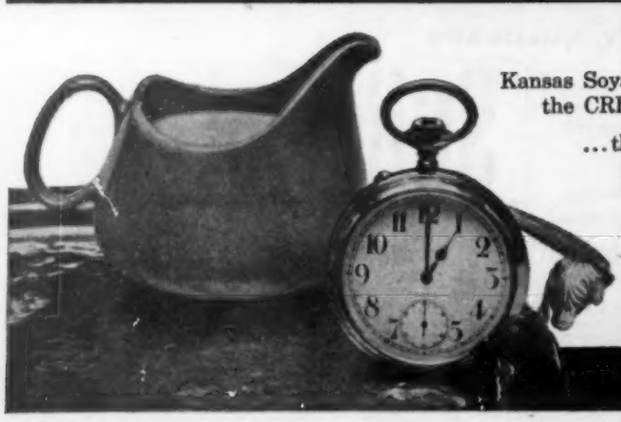

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These programs are available to those interested and may be obtained by writing the various manufacturers concerned."

Dr. Clawson, animal industry department, reported on research data gathered from various experiment stations during the past 10 years. His report covered antibiotics, arsenicals, sulfa drugs, chemobiotics, synthetic hormones, enzymes and tranquilizers for swine.

Dr. C. G. Durbin, FDA, Washington, D.C., spoke on feed additive problems as they affect the livestock industry.

Dr. Durbin stated that the farmer is no longer just a farmer; today, he is a food manufacturer. Originally, the farmer's primary purpose was to produce just food for his family. Now he must provide food for the nation.

Human Health

Discussing the human health aspects of agricultural chemicals in the production of livestock, Dr. Durbin said, "We are living in a chemical age and environment and certain calculated risks must be accepted in the use of chemicals, not only in food production but in medical practice as well."

The possible hazards of chemical use, he added, are subject to extensive scrutiny through toxicity testing, label warnings and directions for use, inspection procedures by the various governmental agencies and controls imposed by manufacturers.

"The FDA," Dr. Durbin reported, "requires long-term toxicity data for food and feed additives with some extending up to seven years. Also, FDA requires test data on three different species of animals."

The farmer's disregard of warning statements is a concern of FDA.

Classes of Additives

According to Dr. Durbin, feed additives may be divided into three classes:

(1) Drugs for prevention of disease or parasites.

(2) Drugs for the treatment or control of disease outbreaks or parasitic infections.

(3) Drugs for stimulating rate of growth and for improving reproductive efficiency.

"The question we should ask ourselves is 'Does the feed additive provide beneficial effect without a harmful potential?' "

Dr. Durbin said, "The feed additives, provided by the pharmaceutical industry, have permitted the poultry industry to grow into the multi-billion dollar industry of today. This has materially contributed to the availability of inexpensive animal protein in the diet of our country. The beneficial effect is thus obvious both for the poultry industry and the general health of the public."

Management

Following the joint session of the veterinarians and the feedmen, the field service men spent a day and a half discussing livestock and poultry management, nutrition, disease control and prevention of disease.

Prof. M. E. Senger, dairy extension, explained the use of the electronic brain as an aid to dairymen in feeding and management. North Carolina State College serves the Southeast with its Dairy Records Processing Center and is one of 10 such centers in the nation, he said.

"For 10¢ per cow per month, the dairyman gets additional information for feeding and managing his herd," he said. "He also learns whether he is under- or over-feeding his cows, how much feed to give the individual cow, when to dry off and breed cows, how much his feed costs per 100 lb. milk produced and the amount of milk produced per man employed—all this in addition to the regular testing information."

According to Prof. Senger, the tester sends the testing information to the Dairy Records Processing Center, and within 10 days the complete report is in the dairyman's hands.

"In many instances," Prof. Senger reported, "this scientific feed information helps farmers to feed more efficiently and reduce feed costs. It also enables the dairyman to manage his herd at peak performance."

The two-day field service men's program ended following a question and answer period, "Stumping the Experts."

$7,000 Poultry Grant

COLLEGE PARK, MD.—The University of Maryland poultry department has received $7,000 from Merck & Co., Inc., for research on two species of pathogenic protozoa causing disease in birds, the university announced.

Under the direction of Dr. Mary Shorb, the project is a continuation of studies which have been in progress since 1947.

Funds from the new grant will be used to study nutrition of protozoa, single cell animals, from two species of birds, turkeys and pigeons. According to Dr. Shorb, the basic study of bacterial and protozoan nutrition might be the key to the control of some diseases. "When the nutritional requirements of protozoa and bacteria are known, it is then possible to inhibit their growth," she explained.

MILL CHANGES HANDS

HORICON, WIS.—Cousin Hugo's Mill has been taken over by Otto (Tommy) Bleifuss. Mr. Bleifuss has been employed at the mill for the last 14 years. Hugo Henkel had operated the mill for 20 years.

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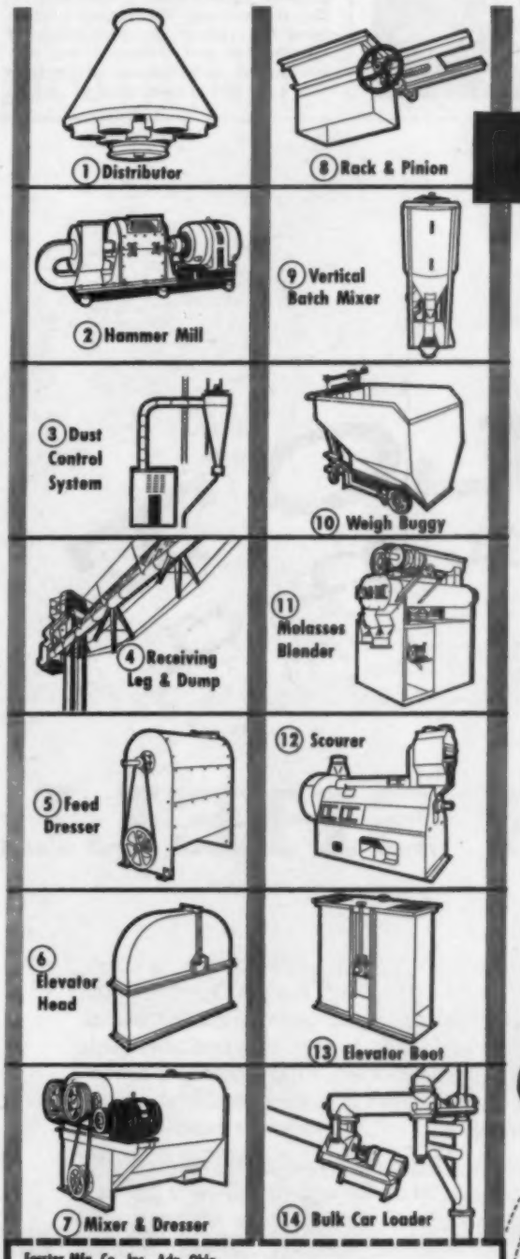

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Alfalfa Improves Hog Carcasses, But Slows Gains in USDA Tests

WASHINGTON — Carcass quality of hogs can be improved by feeding more alfalfa as well as by maintaining higher protein levels in finishing rations, U.S. Department of Agriculture scientists report. But, they also find that more time and feed are needed to produce a market hog when extra alfalfa is used.

Two series of experiments were conducted by the Agricultural Research Service at the Agricultural Research Center, Beltsville, Md. Researchers studied the effects of adding 16 or 28% dehydrated alfalfa meal to the rations of swine weighing 100, 125 and 150 lb., and the effects of reducing protein levels during finishing in feedlots.

USDA researchers report that carcass backfat, bacon thickness and the percentage of total fat were significantly reduced by feeding extra alfalfa to hogs of all weights tested.

Progressive decreases in rate of gain and feed use efficiency took place at all weights, however, where the alfalfa content of the diet was increased from 4 to 16 or 28%. Rate of gain dropped from 1.65 lb. per day with 4% alfalfa to 1.55 and 1.40 lb. per day as the alfalfa content increased. At the same time, in hogs of 100 and 125 lb. live weight, it took more feed (4.12 lb. compared with 4.22 and 4.59 lb.) to produce a pound of gain as the alfalfa content rose. Adding extra alfalfa in the diet of the 150 lb. hogs improved carcass grade and increased carcass length but produced only slight effects on rate of gain and feed efficiency.

Protein level, in the other experiment, caused no changes in rate of gain or feed efficiency, according to the researchers. The higher protein level did reduce the percentage of carcass fat and increased the percentage of preferred cuts of meat. In this test, the protein level of one lot of pigs was reduced from 18 to 15% when the pigs reached 125 lb., and another group of hogs had the protein level of their diet reduced from 14 to 11%.

Half the pigs in the protein study were fed chlortetracycline. This gave significant effects—reduction of backfat from 1.77 to 1.65 in.—only on pigs receiving the antibiotic during the first half of the experiment.

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Tested-Steer Feeding Trials Set in Iowa

AMES, IOWA—Several Iowa cattle feeders plan to feed steers from production-tested western herds starting next fall in supervised experimental and demonstrational feeding trials on-the-farm, Robert C. de Baca, extension animal husbandman, said at Iowa State University.

Arrangements were made at a meeting of Iowa cattle feeders and cooperative extension service men with Colorado cattle producers and extension men at Denver last month. Individual contracts for purchase of the steers are to be arranged next summer for fall delivery, Mr. deBaca said. Colorado producers of tested stock will furnish Iowa buyers and researchers with the performance records of sires and dams and preweaning performance of the feeder calves they sell for the feeding-trial project.

This is believed to be the first such arrangement undertaken in the U.S., and it will be handled as a pilot study of the value of feeders from production-tested herds. Iowa State University researchers will analyze the records of the feeders after the cattle are marketed. The records will include daily rates of gain and complete carcass information.

Texo Feed Mills Credit Manager Is Named

FORT WORTH—Ken Akins, 29, of Hurst, Texas, recently has been named credit manager of Texo Feed Mills, Fort Worth.

Ken Akins

Mr. Akins attended Baylor University until 1949. He has worked for Employers Casualty Insurance Co. and U.S. Rubber Co., and is known in southwest feed and milling circles. He is married and has two children.

Industrial Equipment Leasing Plan Available

SAN FRANCISCO — A national plan which permits customers to lease John Deere industrial tractors and equipment has been announced jointly by Boothe Leasing Corp., San Francisco, and Deere & Co., Moline, Ill.

The plan will operate through the John Deere dealer organization and will be limited to the company's industrial and commercial customers, including granaries and milling firms, dehydrating plants, shippers and builders.

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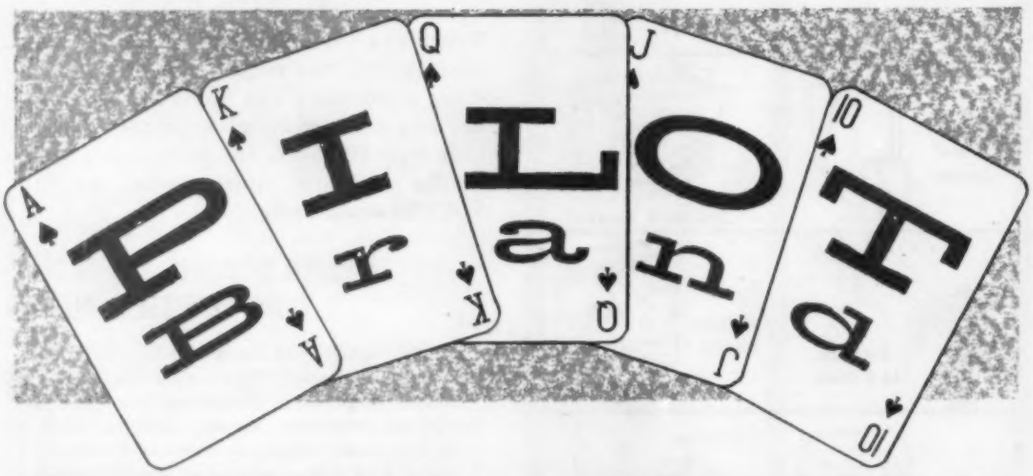

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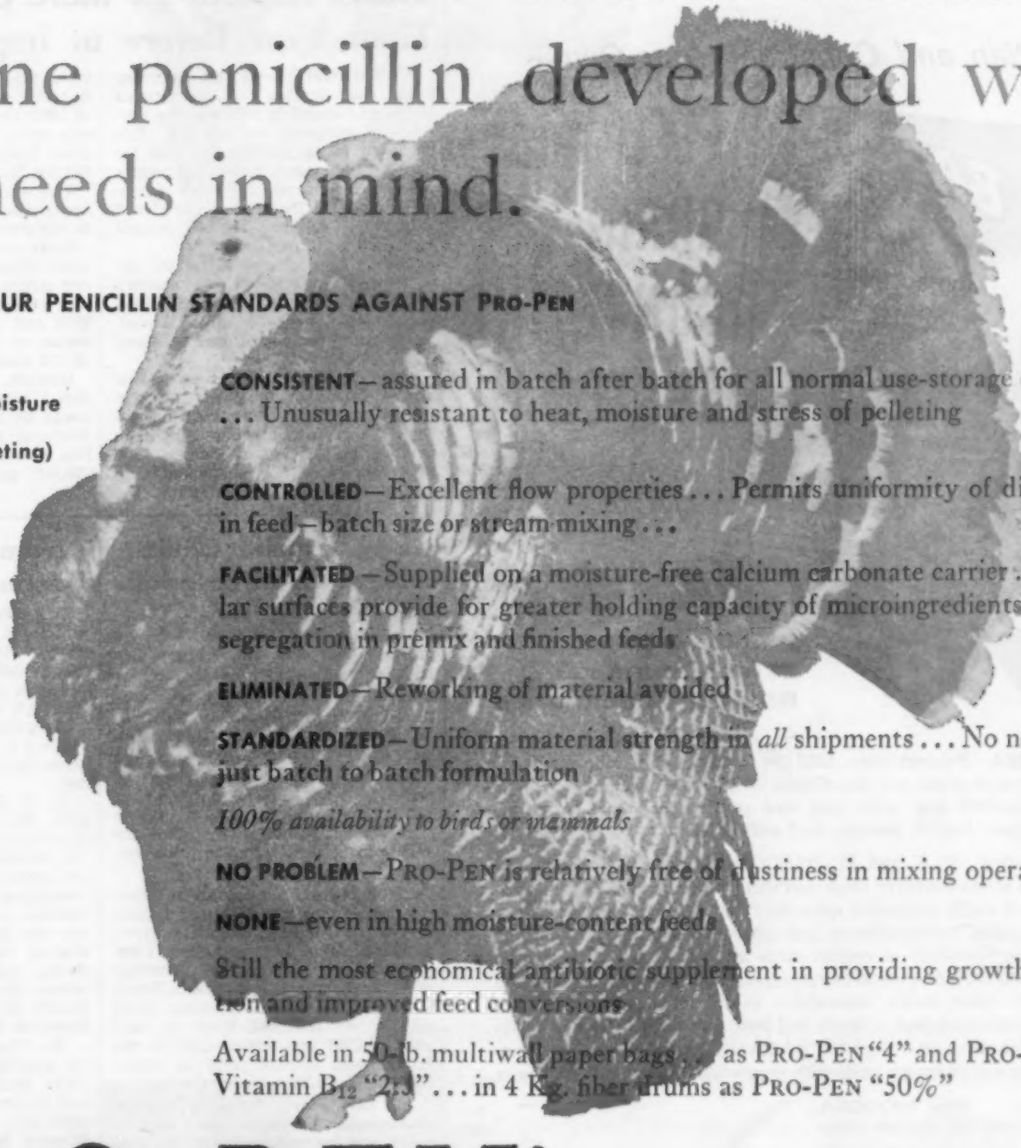

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Commercial Broiler Production and Gross Income in 22 States, 1958-59*

State and total	1958 Number produced	1958 Pounds produced	1958 Price per lb.	1958 Gross income‡	1959† Number produced	1959† Pounds produced	1959† Price per lb.	1959† Gross income‡
	thousands		cents	thou. dol.	thousands		cents	thou. dol.
Maine	56,475	214,605	19.4	41,633	57,604	218,895	17.4	38,088
Connecticut	30,356	103,210	19.8	20,436	24,410	87,153	17.4	15,165
Pennsylvania	42,349	148,222	20.4	30,237	38,543	138,755	19.3	26,780
Indiana	44,912	152,701	18.8	28,708	39,523	134,378	16.0	21,500
Illinois	8,419	26,941	18.3	4,930	7,064	22,605	15.9	3,594
Missouri	33,900	106,098	17.8	18,706	37,465	119,888	15.0	17,983
Delaware	94,250	329,875	19.0	62,676	84,825	296,888	17.0	50,471
Maryland	86,209	293,111	19.0	55,691	92,244	322,854	17.0	54,885
Virginia	63,496	196,834	18.3	36,021	83,971	167,310	16.1	26,937
West Virginia	27,252	89,932	18.8	16,907	27,797	91,730	16.9	15,502
North Carolina	134,600	444,180	17.6	78,176	137,400	463,420	15.2	68,920
South Carolina	17,561	57,951	18.0	10,431	17,100	56,430	15.5	8,747
Georgia	292,119	934,781	17.6	164,521	303,031	1,000,002	16.3	163,000
Florida	11,319	35,089	18.3	6,421	10,413	33,322	16.1	5,365
Alabama	131,640	421,248	17.6	74,140	154,221	508,929	16.1	76,048
Mississippi	85,424	264,814	17.7	46,872	107,469	333,154	15.2	50,639
Arkansas	133,331	399,993	17.6	70,399	163,997	508,391	15.0	76,259
Louisiana	20,479	63,485	18.0	11,427	21,437	68,598	15.5	10,633
Texas	114,855	344,565	18.5	63,745	109,058	338,080	15.5	52,402
Washington	14,939	50,793	20.7	10,514	15,985	52,755	18.6	9,812
Oregon	8,340	26,688	19.6	5,231	10,946	36,122	17.8	6,430
California	47,839	157,869	21.0	33,152	49,753	169,160	18.9	31,971
Total	1,500,063	4,861,977	18.3	890,974	1,566,256	5,158,814	15.9	821,931

*States having weekly chick placement reports. †Preliminary. ‡Includes consumption in households of producers which is less than 1% of total production.

USDA Reports 4% More Broilers in '59 Than Year Before in Important States

WASHINGTON — A 4% increase from the number of commercial broilers produced in 1958 was the preliminary estimate by the U.S. Department of Agriculture for 1959 for the 22 important producing states covered by its weekly chick placement reports. The number produced —1,566,256,000 birds—is the largest of record for these states.

The 22 states involved in the report produced 90% of the nation's broilers in 1958. Assuming the same proportion in 1959, the nation's overall total for the year would be about 1,740,284,450 birds.

Mainly because of the exceptionally large production, the average price received was 2.4¢ per pound less than the average price in 1958. The average price received for the 1959 production was 15.9¢ per pound.

The gross income reflected the lower price received for birds in 1959, dropping 8% from the gross income of 1958. Gross income in the 22 states was down almost $70 million, falling from $890,974,000 in 1958 to $821,931,000 in 1959.

The average weight per bird produced was up slightly from 1958, 3.3 lb. compared with 3.2 in 1958.

Increases in other states, particularly Georgia, Alabama, Mississippi and Arkansas, offset the nine states that produced fewer broilers than in 1958 and resulted in an over-all increase of about 66 million birds for the 22 states.

Georgia, the leading state, produced 303,031,000 birds in 1959, followed by Arkansas with 163,997,000, Alabama with 154,221, North Carolina with 137,400,000, Texas with 109,058,000, and Mississippi with 107,469,000.

ADM Transfers Sales Officer to Minneapolis

MINNEAPOLIS—Loren D. Compton, manager of millfeed and by-product flour sales for Commander Larabee milling division of Archer-Daniels-Midland Co., has been transferred from Kansas City, Mo., to ADM's general offices in Minneapolis.

His duties in Minneapolis will be broadened to include direction of ADM flour sales for export and to government agencies and other institutions as well as millfeed and by-product flour sales.

Mr. Compton, a graduate of Kansas State University with a bachelor's degree in milling administration, joined ADM in 1950 as assistant superintendent of the bulk storage plant at Commander Larabee's North Kansas City mill. Following army service, he returned there in 1952 and in 1953 was transferred to the Hutchinson, Kansas, mill as warehouse and loading superintendent.

In 1954, Mr. Compton entered Commander Larabee's sales department and became southwestern feed sales manager the next year. He was named millfeed sales manager in 1957 and manager of the by-products department in 1958.

COMPTROLLER NAMED

DECATUR, ILL.—Election of Charles V. Glynn as comptroller of A. E. Staley Manufacturing Co. was announced by Donald E. Nordlund, vice president. Mr. Glynn has been administrative assistant to Mr. Nordlund, and was previously secretary-treasurer of the firm's U B S Chemical Co. division, Cambridge, Mass. He succeeds L. B. Huffer, who recently resigned.

Assumes Service Duties For Peavey Feed Mills

MINNEAPOLIS — Victor Jorges, associated with Peavey Feed Mills since 1957, will assume additional responsibilities in research and service work with the resignation of Homer Munson, farm service director.

Victor Jorges

F. T. Heffelfinger, II, general manager, said. Mr. Jorges' principal duties will be counseling with feeders and dealers on livestock management and disease control and working with dealer and feeder education programs. He is a graduate of the University of Minnesota with a major in livestock husbandry.

Mr. Munson resigned his position to operate a farm near Brandon, Minn. He was with Peavey Feed Mills and its predecessor organization since 1951 and was named farm service director in 1955.

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Livestock Production Pattern Changes

Trend Toward Fewer, Larger, Specialized Feedlots in Midwest Shown in Analysis.

By James S. Holderness
Doane Agricultural Digest

What about beef cattle and beef feeding? Now we have the spotlight trained on the subject that has a growing number of midwesterners concerned, although they have just tucked two reasonably good feeding seasons under their belts. Farm feedlots in the Midwest lack the glamour and the profits shown by feedlots in the West and Southwest. This is not to say profits per head handled aren't as good or better. The area that once stood alone as dominant in cattle feeding now has challengers arising on all sides.

A good many leading Corn Belt feeders recognize that unless some rather extensive changes are made during the 1960's, the Midwest will lose more prestige as a feeding area. I think you can be confident that the required changes will be made. In the process, you can expect that three out of every four feeders now finishing out a bunch of cattle each year will be out of the feeding picture inside the next 10 years. These men will be replaced by a new kind of feeder.

I will cover some of the changes that are seen for midwestern beef cattle finishing sections over the next decade; but before this, how did we get where we are today?

CARLOT FEEDING SPAWNED IN THE MIDWEST — Along about the early 1900's some new twists developed in beef fattening which were unlike anything known anywhere in the world previous to this time. All of this took place right here in the Corn Belt. Cattle were moved several hundred miles off western grass ranges. They changed hands and were fattened in a section where grain was in surplus. The cattle were eventually sold on a large central market. This was the beginning of the "carlot" cattle feeding system that has dominated the Corn Belt for half a century.

Chicago is one reason why the system worked. By the early 1900's the city had a heavy concentration of people with incomes large enough to permit a dependable demand for high grade fed beef. This and other reasons made Chicago the nation's major market, taking better than three million head of cattle annually.

In 1910, seven Corn Belt states were estimated to have had a third of the country's beef cattle, and considering the "immense" number of cattle shipped in for fattening, a writer of those times estimated that not less than one half of the beef cattle industry was centered in this section.

Through the next 20 years the Corn Belt continued to gain dominance as the major feeding section. In the early 1930's it is estimated that 83% of the cattle on feed during the winter were carried in the north central states. This era seems to have marked the zenith of the Corn Belt's feeding supremacy.

CHANGES THAT BROUGHT ON COMMERCIAL FEEDING — During the 1930's the drift of population westward was accelerated, creating a dependable market for fed beef in new areas. Irrigation made high quality roughage available to arid sections. Improved roads and trucks made it simpler and less costly to move feeds into feeding sections located outside growing southwestern and west coast cities. By-product feeds—beet pulp, cottonseed, mill run and others—became available and feeding was begun. In many instances all the feed used was purchased and continuous feeding of large numbers was essential.

Marketing outside the Corn Belt took a somewhat different tack because the larger packers didn't have plants in the new feeding sections. In most cases, small independent packers set up shop and often bought directly from the feedlots rather than working through a terminal market. Some of the largest feeders set up their own slaughter plants.

Following World War II, Safeway and other big supers became the price-setters in western meats as their buyers became the major outlet for the independent packers. This trend has spread into other sections until today we find that the larger supers are buying 80% of the meat that moves into the nation's retail trade.

Specialization

In general, the smaller packing plants have been able to operate more efficiently than the larger, even though they may not be able to make as good use of their by-products. Often they will specialize in killing a certain class of beef—heifers, 600-lb. calves, etc. They are well able to supply meats to the specifications of supermarket buyers. They carry small inventories and turn these over quickly—making better use of their facilities than the larger packers. The large terminal markets and the large packers tended to lose importance.

Chicago, once a major slaughtering center, is today without a single major meat packer killing beef. There are, of course, independents in the area. Slaughter has shifted more and more to smaller houses killing closer to the centers of production. This has changed the pattern of meat movement that was established when "carlot feeding" was in its heyday.

Eating Habits

Another important change in the past 20 years has been the eating habits of people. They want less fat. The improved breeding now found in range cattle has made it possible to produce a desirable fed beef carcass after a shorter feeding period than in the past. Less fat cover is required to produce tender cuts of beef. As a result, the long fed cattle typically produced in the Midwest are somewhat less in demand and enjoy a much smaller price premium now. There is talk among federal meat graders that Prime as a grade may eventually go by the board.

"New Class of Cattle, Feeders"

Combined, these factors have tended to take the edge off the demand for the proverbial "steer fed a crib of corn" and created a climate favorable for a new class of cattle and a new class of cattle feeders —who have a continuous flow, and a standardized feeding operation that turns out a Good to Choice carcass.

The changes we have been talking about so far have reduced Corn Belt feeding dominance. (This is reflected in the figures shown in the accompanying table.) In the early 1930's, 83% of the cattle on feed Jan. 1 were in the north central states. Although actual numbers of cattle on feed for these sections were well above 1930 levels, early this year there was an 11% reduction in the proportion of the nation's cattle these states were feeding. They were feeding 72% of the nation's total cattle on feed. There has been a much faster increase in cattle feeding outside the Corn Belt.

Growth in West

Nearly four times as many cattle were on feed in the West early in 1959 as in the early 30's. California and Washington show the greatest growth on the west coast. Arizona, New Mexico and Idaho also show rapid gains. Feeding has increased in Texas and the Southeast, too.

The far greater share of the cattle fed in the western areas is finished in highly specialized, mechanized, continuous feeding lots. These feeders must operate this way, handling large numbers of cattle, to stay in business. Many of these operators have no farming operations to supplement their incomes. Feeding is their specialty and their livelihood. For others, feeding is a market for their grain and the by-products of their cash crops. But great quantities of other feed must also be purchased.

EDITOR'S NOTE: In this article, James S. Holderness, western editor, Doane Agricultural Digest, St. Louis, covers some of the changes seen for midwestern beef cattle finishing over the next decade and reports on conditions which led to these developments. The article was adapted from a talk Mr. Holderness gave at the Livestock Conference of the Iowa Farm Bureau Federation in Des Moines. The author discusses developments which are of significance to feed men not only in the Corn Belt but in other areas as well.

A LOOK AT THE TWO SYSTEMS —What we end up with are two basic feeding systems—one the smaller farm feedlot with 50 to 150 to 400 head, the other, a larger commercial type operation handling 1,000 head and up at a time. There are few in-betweeners. One is basically a means of marketing farm-grown grains and roughages, the other is usually operating on a purchased feed basis.

The larger operations will handle 1,000-3,000 head at a time or 2,500-7,500 cattle per year since the turnover is about 2.5 times per year. A few lots range up to 10,000-35,000 head capacity, but most of these are on a custom feeding basis.

Very often their labor efficiency approaches one man per 1,000 head handled per year. Typically, the 5,000 head per year operation will have two men feeding, two men handling roughage, grinding hay or hauling silage and one man will be in charge of the feed mill. Examples of this size setup can be found in the San Joaquin Valley of California; Maricopa County, Arizona; the Greeley area of Colorado; around Lubbock, Texas; in the Nampa-Caldwell section of Idaho, and around Garden City, Kansas. Spots around Omaha and Sioux City are moving towards this rapidly.

Smaller Feeder

At the other end we have the smaller feeder with 50-150 head and sometimes up to 300-400 head who feeds on a seasonal basis, maybe handling two batches of cattle per year, short-feds and long-feds, but who runs mostly on the grain and roughage he raises.

The larger feeding operation has the advantage of mass feeding, newer types of feeds and feeding equipment, a smaller labor force per head fed and definite advantages in selling. He, the large feeder, cannot afford mistakes. The majority of his sales are made at home with the buyer coming out to the lot in person, or, in the case of the Southwest, sending bids out daily by mail for delivery at a future date.

By handling a large number of cattle the commercial feeder can make a significant income on a small margin per head. Even with a return above costs (including depreciation, death loss and all) of only $5 the 1,000-head capacity setup would show earnings of $12,500 for the year. This is a substantial amount and the enterprise is independent or on its own. It's on a business basis.

Saving Feature

The smaller feeder usually has the advantage of selling his crops through his cattle—and this is the saving feature for the system. The smaller feeder can still make mistakes and stay in business. Finally, he has an outlet for labor during a period when field work is out of the question. And mechanization is bringing some of the advantages of the commercial feeder to the farm feeder.

Even with profits of $20 per head the total earnings on the smaller lot are small. With a 100-head turn of cattle at $20 earnings, there is only $2,000. It cannot be considered an independent enterprise, but must be combined with crop enterprises to

Number of Cattle and Calves on Feed, by States, 1930 to Date

State and region	Number — Average — 1930-34	1940-44	1950-54	1957	1958	1959	% Change 1930-34 to 1959	% U.S. total 1959
	thousand head						%	%
Pennsylvania	53	74	89	90	78	77	45	1.2
Ohio	93	128	157	189	176	190	104	2.9
Indiana	87	173	205	305	287	255	193	3.9
Illinois	324	497	532	690	649	643	98	9.9
Michigan	66	91	100	116	110	125	89	1.9
Wisconsin	47	72	96	113	115	113	140	1.7
E. N. Central	617	961	1,070	1,413	1,415	1,403	127	21.6
Minnesota	212	290	306	371	367	400	89	6.2
Iowa	605	921	1,064	1,259	1,284	1,374	127	21.2
Missouri	237	287	231	281	292	292	23	4.5
North Dakota	30	60	66	103	98	114	280	1.8
South Dakota	115	123	196	235	266	290	152	4.5
Nebraska	402	308	546	560	543	637	58	9.8
Kansas	273	242	251	153	180	234	—14	3.6
W. N. Central	1,874	2,231	2,660	2,962	3,030	3,341	78	51.5
N. Central	2,491	3,192	3,730	4,375	4,367	4,667	87	71.9
Oklahoma	36	58	62	64	41	50	39	.8
Texas	87	164	172	154	122	178	104	2.7
Montana	21	30	36	68	66	65	210	1.0
Idaho	26	47	92	121	114	149	473	2.3
Wyoming	16	16	25	31	37	45	181	.7
Colorado	105	180	255	246	251	293	179	4.5
New Mexico	9	21	22	37	33	52	478	.8
Arizona	37	58	93	222	199	210	468	3.2
Utah	20	37	48	55	60	73	265	1.1
Nevada	17	23	22	27	28	31	82	.5
Washington	7	23	27	47	48	60	757	.9
Oregon	8	26	29	34	34	35	338	.5
California	64	150	301	496	398	504	688	7.8
Western	453	803	1,184	1,602	1,422	1,745	285	26.9
U. S.	2,997	4,069	5,003	6,067	5,867	6,489	116	100.0

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support the owner. It's not a complete, independent business.

The question might be asked, what kind of returns per head can usually be expected?

Generally, returns from steer feeding are best when cattle prices are following a rising price trend. When prices are steady or declining, returns are poorer. Actually, returns above feed, not including overhead, death loss and some other minor costs were calculated as follows for the feeding seasons from 1949 to 1958:

Year	Return
1949	$75
1950	$83
1951	$21
1952	—$24
1953	$39
1954	$16
1955	$11
1956	$40
1957	$72
1958	$44

In these 10 years, feeding returns averaged $38 per head. There was a period of good returns in feeding in the early 1950's and again in the last two feeding seasons, but in the six years between, including the $24 loss in 1952, returns averaged out to $17. Handling up to 150 head, that's $2,550 supplemental income, but not a business, or real incentive to enlarge the feeding enterprise or enough cash to build a reserve to finance a commercial type feeding installation. Of course, this is only a portion of the earnings of the farm. At levels of 1,000 head of cattle the $17,000 return would make the feedlot an independent going concern—and this is during the period of smaller returns per head.

Looking Ahead

Now, to look ahead, cattle prices passed their peak last summer. They are now on the downtrend. Skipping over a lot of reasoning that could be included here, it suffices to say we face a period in feeding returns similar to that in the mid-50's, barring some unseen national emergency. Returns per head above costs may actually average lower, based on stiffened competition from the mass feeders. Lower margins can, of course, be expected to hasten the changes that are seen ahead for feeding sections in the Corn Belt.

CHANGES SEEN IN THE 60'S IN MIDWEST FEEDING—As a result of the action of the trends that seem to be in force now in agriculture and meat processing and consumer demand, we at the Doane Agricultural Service look for these changes, which really are already under way, to take place in Iowa feeding sections in the next 10 years—the period from 1960 to 1970. The automatic feeding systems in the larger lots are already moving in.

For every eight men feeding cattle on a 50- to 150-head basis in 1959, two will be displaced from farming by the end of the 60's. Two others will be farming but not feeding. They will likely have consolidated units and will be on a strictly cash crop basis or handling other livestock enterprises besides cattle. Two of the eight feeders will likely still be plugging along on a 50- to 150-head basis. One other man of the eight will have doubled or tripled his feeding capacity to 150- to 450-head level and another will either follow suit or, with the aid of outside capital, will be on a full-time, continuous feeding basis, handling 1,000 head or more annually.

What have we done to total output of fed beef for the Corn Belt? It's up! Iowa and other states nearby will continue to increase the number of cattle being fed for slaughter and the Corn Belt will remain a number one feeding section.

1949
16 feeders @ 100 head
Total: 1,600 head

1970
1 feeder @ 1,000 head
3 feeders @ 300 head
4 feeders @ 100 head
4 ex-feeders farming
4 ex-feeders out of agriculture
Total: 2,300 head

Half as many farmers will be required to do the feeding. Nearly half again as many more cattle will be finished out. To put it on another basis, where 16 feeders are selling 1,600 head annually today, eight feeders will be marketing 2,300 head by late 1960.

I want to be the first to tell you that these figures are wrong. You probably haven't believed me anyway. No one knows exactly how the feeding business in the future will be split amongst those now in the game, but the trend we've discussed is correct. Feeders must decide now where they wish to be 5 years or 10 years hence—out of it entirely or on a bigger basis.

Example in Colorado

There is an area in Colorado that perhaps some of you know. It's worth studying. This is the stretch of country north of Denver that follows highways 85, 87 and 287 north to Brighton, Longmont, Greeley and Fort Collins. It's an area that has seen the kind of transition in feeding that sections of Iowa can expect in the near future. There is an older irrigated section on the west side where good crops of beets, alfalfa, barley and corn are grown and farm feeding is the rule. On the east side along highway 85, following the south fork of the Platte River, is a new feeding section.

It is my observation that few of the older farm cattle feeders have crossed over into the ranks of the commercial cattle feeders. Most are still prospering as farm feeders. Some have dropped out. The new generation of feeders has often come out of the ranks of men connected with some agricultural business who in some cases have not had a great deal of knowledge about feeding, but have been successful business operators and have been able to arrange outside capital.

The individual who takes the role of the large feeder in Iowa will be buying cattle and feed continuously and selling beef every month of the year. He must have business ability and he can make very few mistakes in management.

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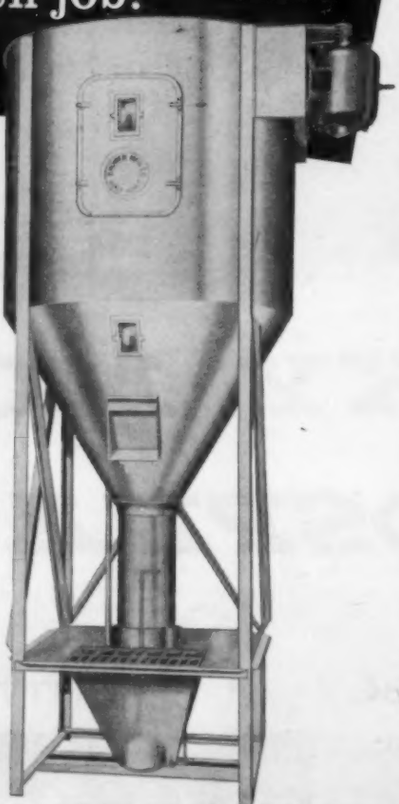

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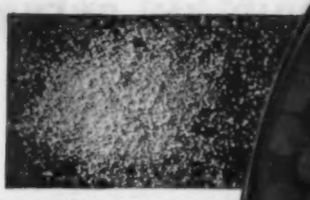

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JOE BROOKS

BY AL P. NELSON

Teach Them and Sell Them

It was late afternoon when Smiley Johnson, one of Joe's employees, dropped into his office. Smiley was a good-looking blond fellow who was mighty handy with a paint brush. When Joe needed a sign, which was quite often, Smiley was capable of turning out a professional job. He also was a good man at the mixers.

"Joe," said Smiley eagerly, "I think I've got a merchandising idea."

"Good!" said Joe. He was always happy when his employees came up with business ideas. It showed that their frame of mind was right, namely, thinking of ways to increase business and profits. It showed his profit incentive program had lasting effects.

"My wife came home last night from the drug store with two bottles of vitamins. Cost her $6.95!"

Joe looked a little puzzled. "Well, what's the point? Lots of people buy and use vitamins."

"Sure," Smiley agreed, "but when I asked my wife why she bought 'em—nobody's sick at our house—she told me she saw a sign in the drug store. The sign advised people to buy vitamins now and ward off winter colds."

Joe nodded. "That makes sense. So what?"

Smiley grinned. "Why, Joe, the sign with its specific recommendations sold my wife. She bought."

Joe blinked. He still didn't understand completely.

"If the sign had just said vitamins or minerals my wife wouldn't have bought. Joe, when we use the words vitamins and minerals in our ads and signs, we've gotta tie up the use of them with something specific that they do in our feeds!"

Joe felt his heart beating faster. "Well, you've hit on a truth, Smiley. How can we improve what we are doing now?"

Smiley Tells Idea

Smiley sat down and crossed his legs. "Joe, I think a good window display can both teach and sell. And the more teaching a sign does, the more it sells. Let's put it to a good test right here in your organization."

Joe chuckled, brushed back his brown hair with a stroke of his right hand. "You know me. I'm willing to try any promising idea. Proceed."

"Let us try a window of our poultry feeds," said Smiley. "We're in the winter egg laying season. Chicks won't be coming in yet for some weeks. Let's list the vitamins, minerals, etc., in our egg mashes and use signs telling the use of each."

"You mean instead of just listing the elements, we give the specific use of each?" Joe asked.

Smiley nodded. "Yep, that's the teaching part of a window. If we teach right it'll enlarge our sales appeal."

By this time Joe was beginning to grasp the breadth of Smiley's idea. "There won't be another dealer in the county using that sort of window appeal," he said, "and that ought to be worth something. We'd list the use of other nutrients, too, wouldn't we—protein, fat, etc.?"

"Certainly," Smiley replied. "When a farmer gets through looking at such a window and reading the signs, he'll know what each element in that bag of poultry mash will do for his laying flocks. And he'll appreciate knowing the functions of each element. It'll be a sales message that will leave an impression in a farmer's mind that won't be forgotten. You work out the copy, Joe, and I'll make the signs."

"I certainly will, Smiley, but won't windows like this take up a lot of cardboard?" Joe said.

The employee shook his head. "No, we can brief up the information. In a window, I'd use only four or five bags of feed and leave lots of space for signs. With open-type windows like we've got, such displays can be seen very easily."

"How about the cardboard cost?" Joe asked.

Cardboard Cost Low

Smiley chuckled. "Don't worry about that. You know me; I make signs nights for lots of other stores, Joe. They have lots of manufacturers' signs. They throw them away when they are finished with them. The reverse sides of these signs are often white, and we can use them for our signs. I'll get some of that stuff for small signs. But we'll have to buy good cardboard for the bigger signs."

"That's okay," Joe said. "I want the windows to look attractive, and yet I don't want the cost too high."

"I'll watch that," Smiley promised. "And, Joe, if this first window works out we can use the same type of listing idea in selling chicks, chick feed,

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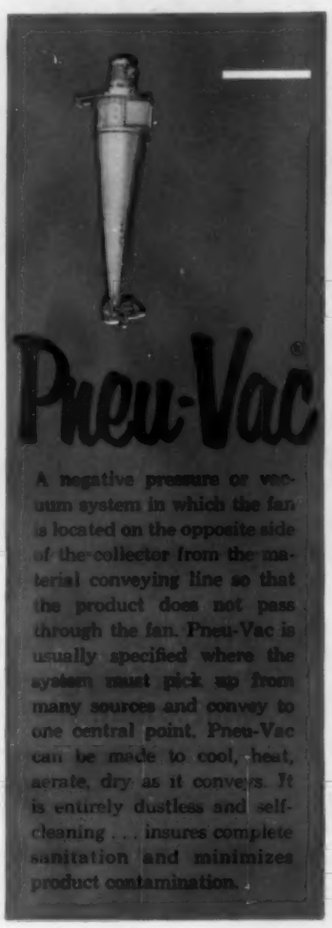

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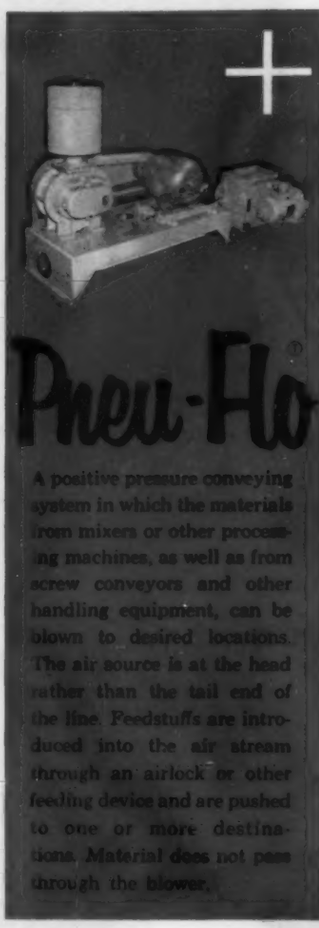
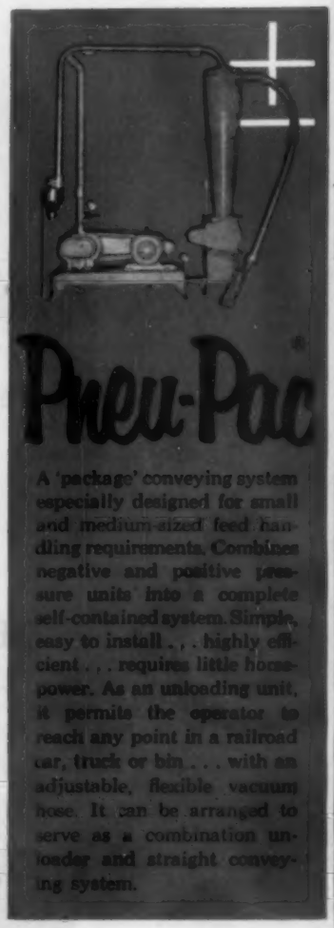
A negative pressure or vacuum system in which the fan is located on the opposite side of the collector from the material conveying line so that the product does not pass through the fan. Pneu-Vac is usually specified where the system must pick up from many sources and convey to one central point. Pneu-Vac can be made to cool, heat, aerate, dry as it conveys. It is entirely dustless and self-cleaning . . . insures complete sanitation and minimizes product contamination.



Pneu-Flo®

A positive pressure conveying system in which the materials from mixers or other processing machines, as well as from screw conveyors and other handling equipment, can be blown to desired locations. The air source is at the head rather than the tail end of the line. Feedstuffs are introduced into the air stream through an airlock or other feeding device and are pushed to one or more destinations. Material does not pass through the blower.



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hog feed, dairy feed and other lines. When we get through, our customers are going to know a lot more about what's in their feed than they know now."

"I can see that," Joe stated. "They'll know why certain vitamins, minerals and other elements are in special feeds. And that will help us to sell."

Smiley nodded. "I think, too, Joe, that you might photograph some of these windows and publish ads about them. That will get the message to others. And you can enlarge some of the photos and display them on the store walls. These photos will continue to tell the vitamin and mineral story long after we take down the window displays."

"That's right," Joe agreed. "The more I think about your idea, the better I like it, Your wife must be like my wife. Whenever the doctor gives her a prescription, she always asks the druggist who fills it, 'What does this drug do?' She doesn't always get the answers as some druggists are close mouthed. But your wife and my wife illustrate something important—the customer wants to know. And if we can tell him what's in our feed and other products, let's tell him. I'm sure it'll make more sales for us."

VyLactos Laboratories Reports Sales Record

DES MOINES — VyLactos Laboratories, Inc., Des Moines, surpassed all previous sales records for a one year period during 1959, according to Bill Rogerson, president.

Production and sales of Scotch O Lass and Omalass, dehydrated molasses products, were up 15% over 1958 and higher than any other 12 month period, Mr. Rogerson said.

Distribution of the firm's products was expanded during 1959 to include Canada as well as 15 north central states.

Wisconsin Committee Is Named to Develop Policy on Chemicals

MADISON, WIS.—Wisconsin governor, Gaylord Nelson, announced that he has appointed a special committee of scientists, representatives of the medical profession and agricultural experts "to develop a decisive and consistent public policy in respect to regulating the use of chemicals as feed supplements, food additives, pesticides, weedicides, growth regulators and for similar purposes."

The following is part of Gov. Nelson's announcement:

"I am highly pleased that Dr. Conrad A. Elvehjem, president, University of Wisconsin, has agreed to serve as chairman of the committee to undertake this urgent and important mission.

"Dr. Elvehjem is an internationally renowned scientist in his own right. He has assured me of the fullest cooperation of the University of Wisconsin in seeking responsible answers to the many important questions concerning the health and welfare of the public raised by the swiftly increasing economic importance of chemicals and drugs in agriculture and in the preparation and preservation of foods.

"The public alarm generated recently over the danger of contamination of cranberries by the chemical aminotriazole has focused attention upon this problem. It is sure to become increasingly acute.

"Public policy in this general area has not been clear and consistent. This exposes the industries concerned to serious economic hazards. The extreme hardship suffered by the cranberry industry demonstrates the potential dangers that exist in this situation, even for firms and individuals who may be completely innocent of any wrong-doing or negligence.

"There is an urgent need to formulate a public policy in this respect which is clear, consistent and decisive. In such a determination, full account must be taken of the effects upon the public health and welfare, soil and water contamination and wild-life conservation, as well as the economic aspects.

"In light of the uncertainty and confusion that now prevails, it is important that we evaluate the tests, conclusions and procedures that were involved in the cranberry problem. We should identify the scope of the over-all problem created by these uses of chemicals. We should carefully analyze and weigh any danger, or potential danger, to human health and wild life.

"The most reliable current information available on this entire problem should be made available to our citizens, to officials of the state government, and to our representatives in the Congress of the U.S."

PRESIDENT GETS WATCH — J. M. Tankersley (left), Gainesville, Ga., incoming president of the Southeastern Poultry & Egg Assn., presents a watch to Henry C. Tilford, Jr., Shelbyville, Tenn., the outgoing president, at group's annual meeting recently in Atlanta, Ga.

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Pneu-Vac Bulletin 18-F
Pneu-Flo Bulletin 208-A
Pneu-Pac Bulletin 211-A

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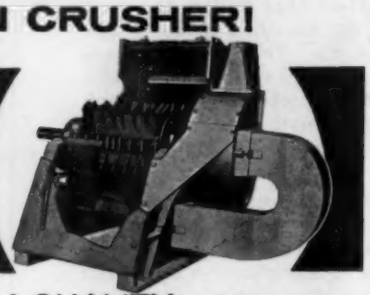

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Vitamin A, CRD Prevention, Feed Labels Discussed at Rutgers Disease Institute

NEW BRUNSWICK, N.J. — Vitamin A research, chronic respiratory disease prevention, education for typhoid, vaccination and feed labeling all were discussed by speakers at an institute in poultry diseases at Rutgers University.

Dr. Robert L. Squibb, chairman of the department of poultry science at Rutgers and a nutritionist, described the results of an experiment with vitamin A at Rutgers.

Dr. Squibb told how birds infected with Newcastle disease were given extra vitamin A in a normal diet. The death rate was 85% and chicks with disease symptoms at the end of 14 days amounted to 90%.

On the other hand, he said, birds on an unsupplemented normal diet considered to be representative of a commercial ration commonly fed in New Jersey showed 65% mortality with 70% disease symptoms.

A third group of birds was reported to have fared best of all. These had been depleted to one-half normal reserves of vitamin A and they showed a 35% mortality and 30% disease symptoms.

Chicks in a fourth group had no vitamin A reserves and all of them died.

Dr. Squibb's summary:

"Our data would indicate that vitamin A reserves are of vital importance and may affect the course of the Newcastle disease syndrome. Birds with low to completely deficient reserves may be expected to succumb to the disease.

"On the other hand, if birds are fed normal diets, they may be expected to have normal reserves of vitamin A. These birds should not be supplemented with vitamin A since the reserves carry adequate quantities of this dietary essential to fulfill the vitamin A requirements of birds under disease stress."

Dr. Squibb said that he got his results in a series of replicated experiments involving 200 chicks in each trial.

CRD Prevention

Prevention of chronic respiratory disease is "far better than cure," stated Dr. R. F. Gentry, professor of veterinary science at Pennsylvania State University. He said underprivileged birds, kept away from food and water by the dominant ones, become weakened and can develop CRD, then spread it to the rest of the flock.

Dr. Gentry's suggestions for prevention were these:

"(1) Start with healthy chicks. Be sure of your source.

"(2) Provide adequate housing, good ventilation, clean litter. 'I wouldn't have built-up litter in my house, because it means built-up population of bacteria.'

"(3) Control traffic through the house. Use a foot bath with creosol disinfectant but not lye.

"(4) Follow a proper vaccination program, using a mild vaccine as early as possible. This is the key to preventing CRD.

"(5) Be critical of your management program. There's always room for improvement.

"(6) Medicate when needed but not just to be doing something."

The speaker said the common cold in humans is similar to CRD in poultry. A virus causes the cold, then a bacterial infection brings on runny nose and other discomforts. Physicians often give antibiotics to stop this bacterial aftermath.

"Poultrymen can do the same for their birds," he said. "Give an antibiotic at a high level, and, if you don't get results in 48 hours, switch to another antibiotic," he proposed.

Education for Typhoid

Dr. E. L. Brower, director of the division of animal industry, New Jersey Department of Agriculture, described fowl typhoid and efforts that are being made to control it. He said it is widespread, but attacks are sporadic.

The quarantining policy previously in effect has been discontinued in favor of an educational program for service men, egg and feed dealers and litter disposal men. He said he feels that by giving talks and providing information on sanitation, his department may, in the long run, attain the same goal as with the quarantine policy.

Immediate step after the disease is diagnosed on a farm is to try to send all birds off for immediate slaughter. Then, after the premises have been cleaned and disinfected, they are reinspected.

The cleanup job includes removal of all litter and refuse from the poultry house and disposal in a place that other poultry can't get to, then addition of flowers of sulfur to all litter to reduce the pH. This chemical is used at the rate of ¼ lb. to 100 sq. ft. inside a house with chickens, and 1 lb. to 100 sq. ft. outside or on litter being removed.

Only equipment that has been cleaned and disinfected may be used in cleaning a house. After the house has been thoroughly cleaned, a suitable approved disinfectant should be applied, preferably by power spray.

Vaccination

Dr. John Grun, poultry disease specialist at Rutgers, emphasized, in his review of Newcastle disease vaccination, that poultrymen may get in trouble by haphazard use of vaccine. Some, he says, don't know what kind of strain they use but just take it off the shelf.

He urged "good vaccine, properly handled and used as recommended."

Feed Labeling

Dr. Stacy B. Randle, state chemist at Rutgers, advised feed dealers in the audience to add only the drugs approved by the Food & Drug Administration and to be sure that labels bear the correct directions. Some farmers, he noted, ask for the addition of other drugs, but he cautioned against doing this outside FDA limitations.

Dr. Randle said he offered his advice to the industry as a reminder to "keep its skirts clean and avoid the risk of running into mass hysteria."

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Trademarks Registered

FT. WAYNE, IND.—Two original U.S. trademark registrations have been received by Central Soya Co.

They are U.S. trademark registration No. 688,879, dated Nov. 24, 1959, for "12% Cattle Sweets," and U.S. trademark registration No. 689,593, dated Dec. 8, 1959, for "Hound-Pack."

Raymond Berruti G. T. Dedrick

Two Promoted by Heterochemical Corp.

VALLEY STREAM, N.Y. — Advancement of Raymond Berruti to head of the chemical laboratory at Heterochemical Corp. and appointment of Gilman T. Dedrick as district sales manager have been announced by William Galler, president of the firm.

Mr. Galler stated that Mr. Berruti "was instrumental in conducting stability tests in the development of 'New Process Hetrogen K'."

Currently, Mr. Berruti is engaged in developing methods of analysis for vitamin K at low levels as used in feeds.

Prior to joining Heterochemical Corp., Mr. Berruti was in charge of the technical service section of the National Dairy Research Laboratories at Oakdale, L.I. He is a graduate of Fordham University. Mr. Berruti is a member of the American Chemical Society and the Animal Nutrition Research Council.

Mr. Dedrick will have responsibility for sales-service and distributor liaison in his territory, Mr. Galler said.

Mr. Dedrick is a graduate of the University of Vermont, majoring in agriculture. He lives in Freeville, N.Y.

Purina Scholarship Program Announced

ST. LOUIS, MO.—During the next school year, 54 seniors in colleges of agriculture located throughout North America and in the U.S. territorial possessions will again be completing their undergraduate work with the assistance of the Ralston Purina scholarship program.

The $500 Purina scholarship is awarded to one incoming senior at each of the 50 U.S. land grant colleges. It is also awarded in three Canadian agricultural colleges and in one college in Puerto Rico.

The student selected to receive the scholarship is recommended by a scholarship committee consisting of faculty members of the college.

This will be the sixth year of the Purina scholarships. During the first five years, the program has assisted 265 students to finish their senior year.

Letters have been sent by the Ralston Purina Co. to all the eligible colleges offering the 1960-61 scholarships, according to an announcement by J. D. Sykes, Purina vice president. The faculty committee chooses the recipient on the basis of his scholastic record, participation in campus affairs and eligibility for financial assistance.

Florida Reports on Enzyme Research With Dairy Heifers

GAINESVILLE, FLA. — Supplementary digestive enzymes did not stimulate growth in dairy heifers in tests conducted at the University of Florida, according to a report in the university's "Research Report."

Dr. J. M. Wing and C. J. Wilcox, dairy science department, said 40 healthy Holstein, Jersey and Guernsey heifers were selected in the Florida Experiment Station herd and divided into two comparable groups during an experimental period of three months.

Six dallisgrass pasture plots equipped with shelters, water cups and concrete feeding areas were used.

The basal ration consisted of the following ingredients in parts by weight: corn, 300; cottonseed meal (41% protein), 400; citrus pulp, 300; dried brewers grains, 100, and wheat bran, 100. Salt, steamed bone meal and calcium carbonate were included at a level of 1%; additional salt, bone meal and red mineral mixture containing iron, copper and cobalt were available free choice. Good quality pangola hay was available at all times and occasionally corn silage was offered to both groups. Five pounds of concentrates during the first month and 6 lb. in the second and third months were supplied per head daily.

The Florida researchers said the experimental concentrate feed contained a fermentation enzyme product at a level calculated to supply protein- and starch-digesting enzymes in the amounts found effective at the Iowa State University experiment station. In addition, a gum-splitting enzyme was included.

An analysis to determine statistically significant differences in linear or curvilinear growth indicated that differences between groups were not significant and that the slight difference apparently favoring the supplemented group had occurred by chance alone.

The researchers pointed out that these results are not in conflict with previous reports, since no attempt was made to duplicate conditions of the previous work. "Where full concentrate feeding is used on dry rations, enzyme mixtures may well prove to be profitable feed additives.

"However," they said, "dairy heifers are not fed to maximum capacity because fattening at this age is unprofitable and undesirable. At normally accepted feeding levels, with appropriate use being made of roughage and succulent forage, the value of supplementary digestive enzymes seems questionable."

MISSISSIPPI EGG PRODUCTION JUMPS

JACKSON, MISS. — Egg production showed an increase of 41% during December in Mississippi, compared to the corresponding month a year ago, with a total of 46 million eggs.

According to the State Department of Agriculture and Commerce, there were an estimated 5,267,000 layers in production, an increase of 30% over the previous December.

The total egg production in Mississippi for 1959 is now estimated at 747 million, an increase of 21% over the 1958 production of 619 million eggs.

again last year . . .

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*against blackhead

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Putting Research To Work

BY SPENCER H. MORRISON, PH.D., D. V. M.

Effects of Grain Preparation on Preferences Shown by Beef Cattle

• M. L. Ray and C. L. Drake, University of Arkansas, Journal of Animal Science, Vol. 18, No. 4, pp. 1333-1338.

ABSTRACT AND COMMENT

Relatively few studies have been made on grain preparation preferences for beef cattle. The University of Arkansas workers have made some interesting observations of such preferences using 15 Aberdeen-Angus calves initially weighing 298-353 lb. Corn, milo and oats were tested in five different preparation forms as the only grain. The forms were: Whole, coarsely ground, finely ground, 3/16-in. pellets and ground pellets (approximately as finely ground as finely ground grain). Lespedeza hay was fed as the only roughage.

The calves were divided into three groups of five by sex and weight and then initially assigned at random to one of the three grains studied. Within each group every individual was subsequently assigned to a different preparation of the allotted grain for one week. At the end of each week, preference of grind or form of each grain was observed as exhibited by the calves when each was offered simultaneously all five preparations of the grain fed to his group for the past week, for an observation period of 30 minutes or less if eating stopped beforehand. A total of 15 weeks was utilized for experimentation, so that by the end of the trial each of the calves had been on each form or preparation of all three grains.

Results

The results showed that during a preliminary period the calves assigned to the various grains preferred the whole forms of both milo and oats more than the other forms of these particular grains. On the other hand, coarsely ground or finely ground corn was preferred to other forms of this grain.

For the complete trial, the differences in feed consumption due to calves and grains were not significant. However, consumption was significantly greater for whole or ground grains than for pelleted or reground forms with the exception of milo. Pelleted milo ranked next to whole milo, and ahead of coarsely ground or finely ground milo in consumption.

Also, finely ground preparations were consumed significantly less than whole or coarsely ground forms, particularly in the case of milo and oats. Whole and coarsely ground grains represented 63, 53 and 51% of the total pounds consumed of oats, milo and corn, respectively. Whole milo and oats were consumed in the largest amount, whereas, coarsely ground corn ranked first and over whole or finely ground corn (26% vs. 25% consumption). These results confirmed the data of the preliminary trial.

It was noted that after becoming accustomed to it, calves appeared to consume whole corn better than when first offered.

Preference Observations

In preference observations any choice by the calves of less than 15 seconds duration was not included in the totals. The first preparation that the calf ate for more than 15 seconds was thus considered to be the first choice. Calves offered more than one grain preparation were selective in their choice. Over 50% of the time they remained on their first choice preparation for 2 minutes or less before sampling another.

These observations are interesting because they point out several facts long suspected on the basis of practical feeding observations:

1. Calves prefer whole milo or oats.
2. Calves do not like whole corn too well at first, but may be educated to it over a period of time.
3. At first, calves prefer coarsely cracked or ground or rolled corn, with second preference being given to finer grinds, etc.
4. Pelleting milo improves its acceptability much more than is true for either oats or corn.
5. Finely ground preparations of grains or reground pellets have low acceptability unless special measures are taken to improve palatability, i.e., molasses additions.

Indications Only

It should be appreciated that such preference trials are indications of preference only, and do not reflect results in terms of gains, finish, etc. Also, older cattle would probably show different preference patterns than calves.

This is an interesting study which needs further work, especially in view of the fact that it shows that calves may not like pellets too well in many instances. Whether or not mixed rations in coarsely ground form are preferable to pellets should be investigated. Also, acceptabiliy of concentrate-roughage complete rations with various types and forms of roughages would be an interesting and challenging field because of the many questions concerning roughage quality as influenced by fertilization, harvesting methods, etc.

•

Timely and Worth Noting

Carbon tetrachloride is sometimes used as an anthelmintic in sheep and cattle. A recent interesting report from Oregon (Muth, Amer. Jour. Vet. Res., Vol. 21, No. 80, pp. 86-87) demonstrates that the chances for toxicity are greater if a low selenium diet is fed to ewes than when higher levels are consumed. It is also interesting to note that the "massive liver necrosis in sheep" occurring on legume pasture appears to be closely identical to nutritional hepatic necrosis of rats and other animals resulting from selenium deficiency.

Sales School

WALTHAM, MASS.—Ten members of the poultry service staff of Wirthmore Feeds, Inc., attended a five-day course of study in advanced salesmanship at the company's home office here.

Those present included: I. B. Bubar, Houlton, Maine; L. F. Andrews, Camden, Maine; J. M. Lawrence, Chesterfield, S.C.; H. R. Drown, Alfred, Maine; R. B. Warren, Bridgewater, Mass.; R. S. Edwards, Cambridge, N.Y.; G. Lewis, Waverly, N.Y.; J. C. Creasy, Bloomsburg, Pa.; C. D. Mattox, Richmond, Va., and A. W. Hall, Southington, Conn.

The sales-service session included presentation of the latest literature on poultry feeding, recent developments in nutritional research and detailed explanations of proven farm management methods.

New Boralloy 350 is made with Boron to achieve a Brinnel hardness of 350. It resists corrosion, abrasion and can be cold formed, drilled, and welded as any other steel. Yet Boralloy's superior structural strength make it economical material for almost any milling application and is equally serviceable in both wet and dry use.

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A small soiled youngster accompanied by his even smaller brother stopped an elderly lady as she was passing their house.

"For a nickel I'll have my brother imitate a hen for you," said the boy.

"And how does he do that, my little man?" asked the lady. "Cackle?"

"No mam," said the little boy. "None of those cheap imitations for us . . . I'll have him eat a worm."

◆ ◆ ◆

A male attendant in a mental hospital noticed a patient with his ear close to the wall, listening intently. The patient held up a finger for the attendant to be very quiet, then beckoned him over and said: "You listen here!" The attendant put his ear on the wall and listened for some time, then turned to the patient and said: "I can't hear anything." "No," said the patient, "and it's been like that all day!"

◆ ◆ ◆

Father was standing at the edge of a cliff admiring the sea below, the sandwiches clutched in his hand. His son approached him and tugged at his coat.

"Mother says it isn't safe here," said the boy, "and you're either to come away or else give me the sandwiches."

◆ ◆ ◆

Then there's the one about the man who stared into the mirror and noting his bloodshot eyes resolved never to go to a bar again.

"This television," he muttered, "is wrecking my eyes."

◆ ◆ ◆

The fancy questionnaire a household appliance company used to survey Iowa housewives brought equally fancy replies. To the question, "What make of garbage disposal unit do you use?" one woman wrote: "Four hogs."

◆ ◆ ◆

I never chide my wife about
The things within her purse,
By one swift look she'd soon find out
My desk is ten times worse.

Panogen Co. Appoints 2 Sales Representatives

CHICAGO—Two sales representatives have been appointed by Panogen Co., division of Morton Chemical Co., according to Dr. Raymond P. Seven, assistant general manager.

Warren K. Dulin was named sales representative in the west Texas-New Mexico area. He was formerly associated with the National Association of Manufacturers in Chicago and was a representative for the American Farm Bureau Federation. He received his B.S. degree in agriculture from the University of Kentucky.

Byron R. Hodgin was named sales representative to assist Gene Crist, sales supervisor, in the Kansas, Oklahoma and Missouri areas. Mr. Hodgin, formerly with Babson Brothers Co., received a B.S. degree in agriculture at North Carolina State College.

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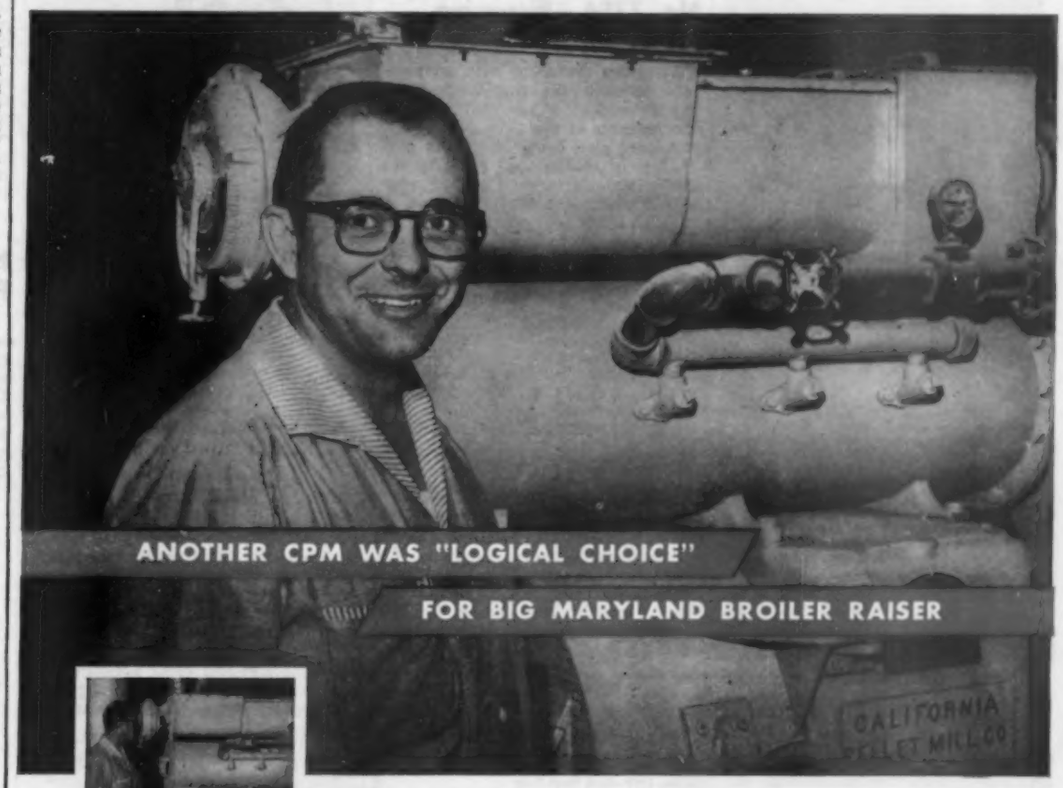

Here's the CPM "HYFLO" that has boosted pelleting capacity for Mr. Fulton, adding to his profits by reducing the cost per ton. There are eight models in California's complete line, with capacities ranging from 1 to 15 tons per hour.

Chuck Fulton started his pelleting operations with a CPM "Master" Model—smallest mill in the California line, but it proved to be a real workhorse. Its fine performance, plus the help he got from CPM field service men in obtaining maximum production from this mill, made a new CPM "HYFLO" his logical choice when expanding operations required a mill of higher capacity.

The Chuck Fulton Broiler Service, located in Snow Hill, Maryland, raises 3½ million broilers a year and is expanding rapidly. About 75% of his "HYFLO" production goes to feeding his own chickens; the rest is sold to other poultry and livestock growers in the area.

Among the features Mr. Fulton likes most about his "HYFLO" are "the ease of starting the dies, trouble-free operation as much as 18½ hours a day, 6 days a week, and the type of skilled servicing—when required—that shows CPM is a good company to do business with!"

There is *one* California Pellet Mill that will best fit *your* needs. CPM research, experience and knowhow as pioneers in the pelleting field, and as the largest manufacturer of pellet mills, will be helpful in your selection. Write for full information or call your nearest CPM representative.

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DESCRIPTIONS OF NEW AND IMPROVED PRODUCTS AND SERVICES PROVIDED BY MANUFACTURERS AND SUPPLIERS ARE PRESENTED IN BRIEF FORM. FOR ADDITIONAL INFORMATION, PLEASE USE THE ACCOMPANYING COUPON.

No. 7797—Poultry Disease Treatment

A ready-to-use form of "Gallimycin Injectable," for poultry disease treatment, has received clearance from the Food & Drug Administra-

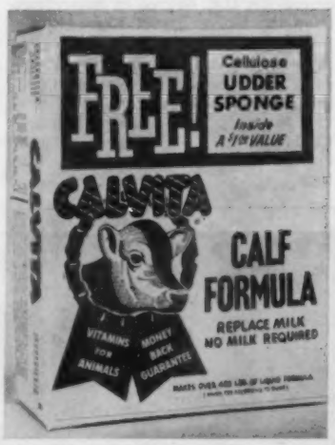
tion, announced Abbott Laboratories, the manufacturer. The product has been cleared for use on the treatment of respiratory diseases in broilers and breeder hens and turkeys. According to the company, within an hour, the product produces blood levels significantly higher than the minimum needed to destroy PPLO—the major causative organisms of common respiratory diseases such as air sac or CRD. The product is available in 250 cc bottle, 12 bottles per case. One bottle will treat 2,500 1 lb. broilers. For details, check No. 7797 on the coupon and mail.

No. 7794—Financing Plan

Five-year financing with an escalator schedule of payments plus a 60-day deferment of the first payment are features of the "gro-as-you-pay" financing plan being offered to purchasers of mobile feed mills by the Daffin Manufacturing Co. The plan is designed to enable purchasers of "Feedmobiles" to get their on-the-farm feed processing business off to faster starts and to build up lists of steady, profitable customers, the company says. The plan has an escalator-type schedule of payments that calls for minimal payments during the first nine months with slightly higher payments following until maximum payments are required after 27 months. For more information, check No. 7794 on the coupon and mail.

No. 7796—Merchandising Program

National Vitamin Products Co. announces a promotional and merchandising campaign for its Calvita Calf Formula. Included in the 1960 program is a premium offer, national



advertising and an emphasis on new packaging. According to company literature, a free udder sponge is being packaged with every 25-lb. box of Calvita. The sponge is worth $1. Window banners, display cards, dealer advertising mats, re-designed packages and other promotional aids will provide further emphasis to the campaign, the company says. For more information, check No. 7796 on the coupon and mail.

No. 7795—Egg Cartons

Tobias Enterprises announces "cushion egg cartons" printed in four colors. The cartons will be made available in small quantities (minimum 2,000 shipment) and will be furnished either printed with "Hen's Best" brand and using pressure sensitive label for showing egg size, grade and egg producer's name, or

without this printing so that the local printer can imprint egg producer's brand name, egg size and grade as quantity of cartons with each egg size needed. Both "Self-locking" and "Sutherland" cartons will be available. A hand carton forming machine is furnished. For details, check No. 7795 on the coupon and mail.

No. 7799—Bulk Feed Body

The North American Manufacturing Co. announces the development of a combination bulk feed body. Designed for economy in initial cost and operation, the company said, the unit for automatic bulk feed or bag feed handling has a capacity of 423 cu. ft. Partitions divide the space into three compartments. It has a completely enclosed gear drive and a full 360° double swivel auger system, and has an all-purpose grain tight truck body. Pump, swing gear and all gate levers are located on the left side of the

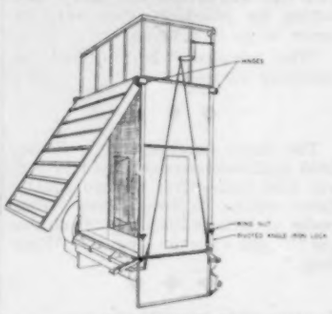
body. The front mounted auger is maneuvered from the driver's side, the company says. More information can be secured by checking No. 7799 on the coupon and mailing.

No. 7798—Proportioning Pump Bulletin

A positive displacement pump for feeding concentrated corrosive chemicals is the subject of a bulletin issued by Proportioneers division of B-I-F Industries. The diaphragm-type pump, Model 1331 Chem-O-Feeder, is made of corrosion-resistant materials. The pump is installed either floor, shelf or wall mounted, and takes suction directly from the chemical shipping container. The two-page, two-color bulletin contains a photograph of the pump, a list of chemicals fed by it and a list of features. For copies of the bulletin, check No. 7798 on the coupon and mail.

No. 7800—Hinged Side Panel

The availability of a simple hinged mechanism to permit rapid and complete opening of the louver panel on each side of the Sprout, Waldron & Co., Inc., vertical cooler has been announced by the company. The modification is particularly important when it is essential that batch to batch contamination be avoided, the



company says. The cooler unit is used for cooling and drying pelleted or small diameter products with a minimum of fines or dust leakage. Stainless steel construction is used for all critical parts in contact with the moisture laden air and the material being handled, the company says. As the material flows downward through the cooling columns, transverse air streams accomplish the cooling. An inspection or clean-out door is provided in the side section

Send me information on the items marked:

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- ☐ No. 7795—Egg Cartons
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- ☐ No. 7799—Bulk Feed Body
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DECATUR, ARKANSAS

of the cooler. Hinged louvers are built into the full height of the cooling tower. The modification for quick interior cleaning is applicable to either fixed or independently hinged louver designs, the company says. For details check No. 7800 on the coupon and mail.

Also Available

The following new products have been described in previous issues of Feedstuffs and information about them may still be obtained by jotting the appropriate number of the coupon and forwarding it to Feedstuffs.

No. 7756—Poultry marketing calculator, Sterwin Chemicals, Inc.
No. 7757—Liquid feed movie, U.S. Industrial Chemicals Co.
No. 7758—Hopper car unloader, Ripco Air Systems.
No. 7761—Mobile feed mill, Barnard & Leas Manufacturing Co., Inc.
No. 7762—Long-term leasing plan, Myers-Sherman Co.
No. 7764—Mixing, weighing unit, Duplex Mill & Manufacturing Co.
No. 7759—Piperazine product, Rhodia, Inc.
No. 7760—Hay shredding device, Daffin Manufacturing Co.
No. 7763—High energy milk replacer, Western Condensing Co.
No. 7765—Conversion table, St. Regis Paper Co.
No. 7766—Chemical dehorning product, Hess & Clark.
No. 7767—Automatic pelleting, Sprout, Waldron & Co.
No. 7768—Air lock feeder, Young Machinery Co., Inc.
No. 7769—Conveyor belting, Russell Manufacturing Co.
No. 7770—Suspended trough waterer, H. D. Hudson Manufacturing Co.
No. 7771—Gravity conveyor, Rapids-Standard Co.
No. 7772—Portable pelletizer, Dodgen Industries.
No. 7773—Loader and Piler, Stephens-Adamson Manufacturing Co.
No. 7774—Round chick fount, National Ideal Co.
No. 7775—Calf formula promotion, National Vitamin Products Co.
No. 7776—Bovitrin promotion, Merck & Co., Inc.
No. 7777—Picking machine, Gainesville Machine Co., Inc.
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No. 7779—Vitamin K assay method, Heterochemical Corp.
No. 7780—Feed mill planning, Myers-Sherman Co.
No. 7781—Screener catalog, Orville Simpson Co.
No. 7782—Dry dog food, Valley Mills.
No. 7783—Guaranteed roller mill, Myers-Sherman Co.
No. 7784—Dehydration equipment, Edw. Renneburg & Sons Co.
No. 7785—Bulk handling report, Fuller Co.
No. 7786—Loading bulletin, Magline, Inc.
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Herman Nagel's
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Where only trace minerals are to be added, Herman Nagel's Trace Mineral Concentrate supplies all eight, in correct balance.

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Cattle Associations Started in Manitoba

WINNIPEG—Feeder cattle associations, conceived by the livestock department of Manitoba Pool Elevators in the early summer of 1959, became a reality in October of that year. The plan, initiated on an experimental basis, has almost exceeded that objective and may easily surpass the 10 associations already established before the first year of "experimentation" expires.

The program was initiated to encourage beef cattle feeding in the province by the producers themselves. Through feeder cattle associations, Manitoba Pool Elevators provides financial assistance to members as well as aid in management and technical help. The plan provides for a feeder cattle purchasing service as well as a marketing service for finished cattle. The basis of organization is the local feeder cattle association and membership is restricted to active members of a local cooperative elevator association. The former requires a minimum of 20 active members in the first year of operation. Feeder cattle associations elect a board of directors, from which are named a president, vice president and secretary who form the executive committee and act as a feeder agreement committee. A local manager is employed by the associations.

Manitoba Pool Elevators in agreement with duly organized associations consider loans to a maximum of $5,000 to members purchasing not less than 10 head of feeder cattle. Feeders not entering into a loan agreement may become members of an association for the purpose of obtaining services provided through the operation of the association.

Dr. Salsbury's Visitors

CHARLES CITY, IOWA—Dr. Salsbury's Laboratories entertained 16 distributors from England, Canada, Italy, Mexico, Argentina, Brazil, Colombia, Chile and Uruguay at its plant here.

The visitors studied the firm's products to be distributed in their countries through the facilities of the Olin Mathieson Chemical Corp.

Buffalo Convention to Include Grain Topics

BUFFALO, N.Y.—Grain banks and the grain situation will be discussed at the Mutual Millers & Feed Dealers Assn. convention at the Statler-Hilton Hotel March 9.

Glenn Siler, head of the Check-R-Mix division, Ralston Purina Co., St. Louis, will speak on the "Grain Bank."

A panel discusion in the afternoon will include such topics as handling of local farm grains, storage costs, insurance and charging for services.

Fred Herman, Dale Carnegie Associates, will also be on the program.

"Our new STRONG-SCOTT equipment makes operating much easier and faster."

Strong Scott

says Carl Smith, Manager of Farmers Co-op Grain & Stock Company, LeRoy, Minnesota.

A remote control for each of the five quick-change screens gives Carl Kempe, operator, immediate selection of grinding size without shutting down the Hammermill between grinds.

Two Strong-Scott TRIPLE ACTION MIXERS provide fast, efficient batch mixing with added molasses when required.

AUTOMATION? "You bet," says Carl Smith, Manager of the Farmers Co-op Grain & Stock Company of LeRoy, Minnesota. "Where we used to have five men to do the work, we now need only one man and can triple our output."

"With the Strong-Scott quick-change Hammermill we have as many as five different grinds in process without shutting down the Hammermill," said Smith. "The farmers really like this because in busy times they used to wait as long as five or six hours for processing and now 20 to 25 minutes is as long as anyone has to wait."

The new addition to the Farmers Co-op Grain & Stock Company at LeRoy, Minnesota, built by **VOLDEN CONSTRUCTION**, Henning, Minnesota, has been in operation only a few months and already the Strong-Scott Hammermill and two Triple Action Mixers have proven they will quickly pay for themselves. "On a normal grind, we turn out two ton in about eight minutes and can then mix two ton thoroughly in three to five minutes in one of our Triple Action Mixers," says Carl. "On a fine grind, which is our 8/64 screen," added Smith, "we grind five ton an hour."

Additional Strong-Scott equipment in use includes legs, drag, crusher, baggers, and a molasses handling system. "A big plus for us is the fine service we get from the Strong-Scott Company," Smith concluded.

THE **BIG YEAR** FOR NEW EQUIPMENT

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451 Taft Street N.E.
Minneapolis 13, Minnesota

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Please send me complete information on the Strong-Scott . . .
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Name_____
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A Review of the Structure, Synthesis, Chemical Analysis And Bioassay of Tocopherol

By Martha Dicks
University of Connecticut

Vitamin E was first recognized as a fat-soluble substance needed for reproduction in the rat. Hence, it was given the chemical name tocopherol. The seven possible tocopherols (25, 29,36,38,84) shown in Figure 1, differ only in the number and position of methyl groups on the ring with the hydroxyl group.

Each of these tocopherols has a characteristic biological activity, with a-tocopherol having the most biopotency.

There are three asymmetric carbon atoms in the tocopherol molecule. One is at position 2 in the ring where the side chain and methyl groups are attached, and the others are at positions 4′ and 8′ in the side chain where methyl groups are attached.

Alpha - tocopherol is synthesized from trimethylhydroquinone and phytol (50). If d-phytol, the natural form (51), is used, the resulting tocopherol will have both the d and l configuration with respect to carbon atom 2 and will have the d configuration with respect to carbon atoms 4′ and 8′. In the earliest commercial synthesis, d-phytol was used. If dl-phytol, the synthetic form, is used, the resulting tocopherol will have both the d and l configuration with respect to all three asymmetric carbon atoms. In the recent commercial synthesis of a-tocopherol, synthetic dl-phytol is used.

As the biological activity of many compounds is directly related to the configuration on the asymmetric carbons, it could be suspected that only certain of these sterio isomers of a-tocopherol would be active. At this time, all data collected to ascertain the relative biopotencies of the different sterio isomers of a-tocopherol (51) indicate that only the configuration on the carbon atom number 2 in the ring where the side chain is attached is important. The synthetic dl,a-tocopherol has less biopotency than the naturally occurring d-tocopherol (33,40,41,42,46,49,79).

EDITOR'S NOTE: The accompanying article is an additional paper from the last Animal Nutrition Research Council annual meeting in Washington, D.C. This paper, along with others, was presented as part of the technical projects committee portion of the program. This article is one of those presented in the discussion of the relative biopotencies of various forms of vitamin E. Papers on standards and diets for vitamin K research have appeared in previous issues of Feedstuffs, and other articles on vitamin A will appear in later issues.

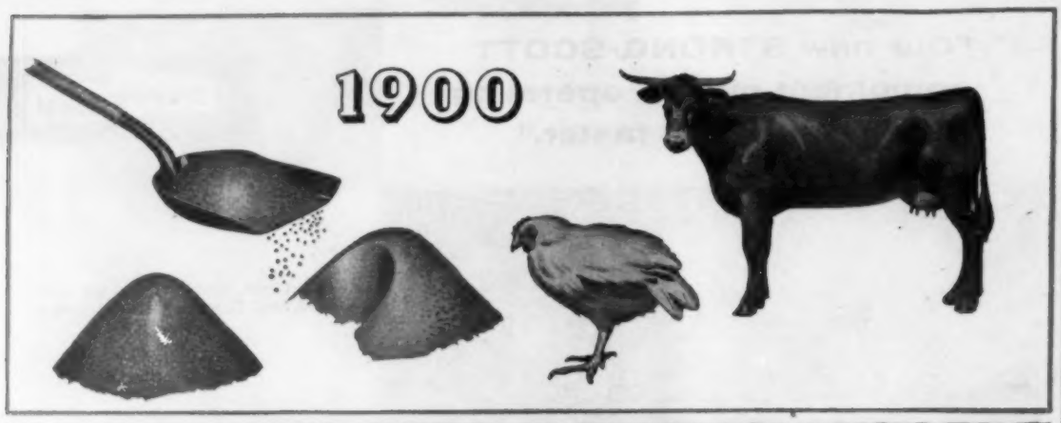
CHEMICAL ANALYSIS—As vitamin E is widely distributed in nature and is important in the nutrition of animals, it follows that we should look for methods to analyze for tocopherol chemically. Tocopherol is readily oxidized in air. Both alkali and ultraviolet light catalyze this oxidation. Esterified tocopherol is very stable, for the hydroxyl group on the ring is blocked and no longer available for oxidation. The oxidation of tocopherol by mild oxidizing reagents (32,43), such as ferric chloride and gold chloride, results in splitting of the ring at the oxygen atom to form tocopherylquinone. Tocopherylquinone can be reduced back to tocopherol with ascorbic acid in hydrochloric acid (43) or to tocopherylhydroquinone with hydrosulfite (43).

Stronger oxidizing reagents (82), such as nitric acid, cause oxidation at the 5 position in the ring with the concurrent elimination of the methyl group at this 5 position and the resulting formation of the ortho or 5,6-quinone that is red in color in ethanol (82). Hence, vigorous oxidation causes the formation of a colored compound that can be directly determined colorimetrically. The weaker oxidizing reactions have to be coupled to a second reaction that causes the formation of a colored complex. Thus, the oxidation of tocopherol by ferric chloride is coupled to the formation of a chelated complex of ferrous ions and a,a′-dipyridyl (19). This reddish orange complex absorbs maximally at 484 mμ and 529 mμ (19).

It is obvious that interference in this color reaction is caused by any compounds that reduce ferric ions, such as carotenoids (21,55,83), gossypol (47,91) and reduced coenzyme Q (78); by any compounds that absorb at 520 mμ, such as carotenoids and xanthophylls; and by any compounds that complex with ferrous ions, such as certain fats (47,52,53,54,83,91). In spite of the nonspecificity of this color reaction, the ferric chloride-dipyridyl method is more sensitive than colorimetric methods using strong oxidizing reagents because it can be used to detect smaller amounts of tocopherol. Although each of the 7 tocopherols has a characteristic absorptivity at 520 mμ (1,58), only δ-tocopherol's absorptivity is enough less to require consideration in most analyses (1,4,47,76,83,84).

Recently, a color reaction that involves the condensation of phosphomolybdic acid with tocopherol to form a colored complex that absorbs near 725 mμ was developed (68,69, 81). However, this complex is also formed with carotene, vitamin A alcohol, reducing sterols and oxidation products of tocopherol (81), while it is formed less readily with non-a-tocopherols than with a-tocopherols (81).

The need for purification of tissue extracts both for the ferric chloride-dipyridyl and the phosphomolybdic acid reaction was shown clearly in a paper by Rosenkrantz (81). A 50% ethanol homogenate of the blood and other tissues was extracted with isooctane. No further purification steps were undertaken before the extracts were analyzed for tocopherol both by the phosphomolybdic acid reaction



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and the ferric chloride-dipyridyl reaction. The poor recoveries obtained suggest that the single extraction with isooctane was not adequate. The fact that the livers, kidney and skeletal muscle showed little change in tocopherol content with addition of tocopherol to the diets of the rabbits indicates a high concentration of interfering substances in these tissues, and hence a need for purification of these tissue extracts. The higher results by the phosphomolybdic acid method indicate that more non-tocopherol compounds in serum, liver and adrenals interfere in this color reaction than in the ferric chloride method, and/or that fat prevented maximum color development in the ferric chloride-dipyridyl reaction (81).

Specific Method

The most sensitive and specific method for analysis of tocopherol is by spectrofluorometry (18). Only high concentrations of vitamin A and phenolic estrogens are presently known to interfere in this fluorescence analysis (18).

The first steps in the analysis for tocopherol are preparation of the samples and extraction of the tocopherol. Tissues have been homogenized in the Waring Blender with organic solvents (14,45,54). This procedure requires large amounts of solvents and several homogenizations to completely extract the tocopherol (45,54). Other research workers have homogenized the tissues (85) or ground the frozen-dried tissues (73) and then extracted them in a Soxhlet-type extractor for 18-24 hours. In some cases, 18 hours of continuous extraction with ethanol removes all the tocopherol in the tissues (73,85), while, in other cases, 24 hours of continuous extraction is needed (73).

If the sample has a high concentration of fat, or the fat interferes in the colorimetric method, or the tocopherol is esterified, saponification is essential. As tocopherol is readily oxidized in alkali, great care must be taken to prevent loss of tocopherol. In order to prevent destruction of the tocopherol the following conditions must be considered: Minimum amount of alkali, minimum time and minimum temperature to get complete saponification (20,23); exclusion of air by replacing the air with nitrogen (23,56) or vapors of the solvent used (58) and addition of a satisfactory amount of an antioxidant, such as pyrogallol (27,28,66,67,86), p-hydroxyacetanilide (27,85) and/or ascorbic acid (4). Immediately after saponification is complete, the mixture must be acidified and/or the tocopherol must be extracted into another solvent (20,23,27,56,68). If any antioxidant was used, all of it must be removed by subsequent purification to prevent its interference in the end analysis. Excellent recoveries of tocopherol can be obtained using the saponification procedure (66,85,86).

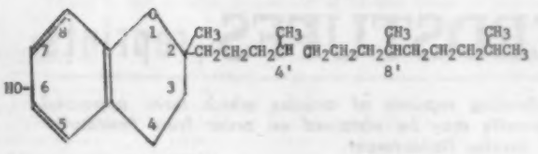
Another procedure that removes certain fats and also most carotenoids, xanthophylls and coenzyme Q (78) is molecular distillation (75, 91). The tocopherol is distilled at 215-220° for 30 minutes at several microns pressure (75). However, molecular distillation requires expensive equipment and is time consuming.

A third procedure that removes certain fats and all carotenoids, vitamin A and gossypol (47), but does not remove coenzyme Q (78), is extraction with 85% sulfuric acid (45, 47, 77, 87). This procedure removes substances with unsaturated bonds (14, 45, 77), but at the same time converts sterols into substances that react in the ferric chloride-dipyridyl color reaction (14, 45). As these altered sterols can be removed by chromatography through florisil (45), these two procedures would have to be used together in the order of 85% sulfuric acid extraction and then chromatography (45, 63, 65), for vitamin A appears to prevent the absorption of sterols on florisil (45). Since 85% sulfuric acid may destroy some tocopherol, 60% sulfuric acid is now used (58). This does not remove all of the above mentioned substances (58).

Column chromatography removes some fat and sterols and all carotenoids and vitamin A, but no coenzyme Q (78). Various absorbants such as florisil (45,65), floridin (1,2,22,27,54, 55,63,85,86), florex (15,78,85), alkaline alumina (19), alumina (13,44, 57,64,67,86) and secondary magnesium phosphate (6,7) have been used. All of these absorbants must be further treated in the laboratory before use in order to make them absorb the interfering substances and to allow the tocopherol to pass through unchanged.

All the highly reduced absorbants, such as floridin and florex, can reduce substances like coenzyme Q (78) to the form that is reactive in oxidation reactions for tocopherol. As

FIGURE 1



Unsubstituted Tocopherol

α- tocopherol :	5,7,8, - trimethyltocopherol
β- tocopherol :	5,8, - dimethyltocopherol
γ- tocopherol :	7,8, - dimethyltocopherol
ζ- tocopherol :	8, - methyltocopherol
ϵ- tocopherol :	5, - methyltocopherol
η- tocopherol :	5,7, - dimethyltocopherol
θ- tocopherol :	7, - methyltocopherol

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alumina does not alter the materials absorbed, it can be used to separate vitamin A, sterols, coenzyme Q, carotenoids and tocopherols into distinct fractions just by changing the composition of the eluting solvent (13,44,64,67). Secondary magnesium phosphate (7) has the added advantages that it can be used to partially separate the seven tocopherols and to remove more interfering substances, such as sterols, than do florisil, floridin and florex.

As hydrogenation destroys interference caused by unsaturation, it destroys vitamin A and carotenoids (72). However, it can also reduce certain nonreactive materials, such as vitamin K and coenzyme Q (57, 58), to readily oxidized forms that react in the ferric chloride-dipyridyl method.

Crystallization from methanol removes sterols (8,27) and some coenzyme Q (13,67).

Once the extract is purified it may prove desirable to separate the seven tocopherols. As these seven tocopherols have different biological activities, this separation is necessary in most analyses of feedstuffs and foods. These tocopherol isomers can be separated by paper chromatography. One dimensional paper chromatography involves either zinc ammine (35,38) impregnated papers developed in cyclohexane or benzene-cyclohexane or paraffin (26,27) or vaseline (8,9) impregnated papers developed in 75% ethanol (8,9,26,27) as the solvent phase. In the former case, the tocopherols are separated into spots depending upon the number of methyl groups in the ortho positions in relation to the 6-hydroxy group in the ring (38). In the latter case, the tocopherols are separated into spots according to the number of methyl groups on the ring (8,27, 38).

Unfortunately, one reduced coenzyme Q travels with a-tocopherol on zinc ammine papers (5). Two dimensional paper chromatography combines these two one dimensional procedures by using the zinc ammine paper developed in cyclohexane or benzene-cyclohexane first, and then impregnation and development in paraffin 75% ethanol (35,38). The seven tocopherols are separated into five spots on these two dimensional chromatograms (38). The tocopherols can be detected on these papers by spraying with ferric chloride-dipyridyl (8,27,35,38), methanolic silver nitrate (8) or phosphomolybdic acid (81), or by adding sodium fluorescein to the papers during impregnation with zinc ammine and subsequently scanning with ultraviolet light (1,35).

Complete Separation

A complete separation of all seven tocopherols can be accomplished by the above two dimensional paper chromatography of the nitroso derivatives of these tocopherols (60,71). Of course, a-tocopherol does not form a nitroso derivative, but it still separates from the nitroso derivatives of the other six tocopherols. Since nitrosation does not destroy the reducing power of the tocopherols, these nitroso derivatives can still be measured by the ferric-chloride-dipyridyl reaction after elution from the paper (60). As coupling with diazotized-o-dianisidine or 2,6-dichloro-p-benzoquinone - 4 - chloroimine destroyed the tocopherols (37), these coupling reactions are not of value for quantitative separation of the various tocopherols after the initial partial separation on paper.

Column chromatography to partially separate the seven tocopherols has been developed using either hyflo super cel impregnated with paraffin (24) or activated secondary magnesium phosphate (7). In the former case, the tocopherols are separated into fractions according to the number of methyl groups in the ring (24). In the latter case, the tocopherols can be separated into three or more fractions depending upon the number of methyl groups in the ortho positions in relation to the 6-hydroxy group in the ring (7). This similarity between the zinc ammine papers and the secondary magnesium phosphate columns would allow the suggestion that reduced coenzyme Q may travel similarly in both chromatography systems also.

In summary, a combination of the above procedures is necessary to purify any biological materials. All reasonable combinations of the above procedures have been used by various groups of workers (1,6,15,44,56, 58,63,65,68,74,76,85,86,87), but some methods have given results that are questionable for particular types of biological materials (3,81,85).

The Vitamin E Panel of the Analytical Methods Committee in Great Britain (1) has suggested the following sequence of procedures for the analysis of oils, foods and feeding stuffs. The analysis should involve all or most of the following sequence of procedures:

Appropriate extraction depending upon the nature of the feed (1,27,76);

Saponification by the method of Tosic and Moore (1,86);

Crystallization of sterols from methanol (1);

Column chromatography on stannous chloride treated floridin earth (1,35,55);

Two dimensional paper chromatography to separate the tocopherols into five zones followed by elution of the individual zones (1,35,38);

Colorimetric analysis with ferric chloride-dipyridyl read at 520 mμ (1,27), and

Calculation of equivalents of tocopherol by using the extinctions established for each tocopherol (1).

Bro-Rasmussen and Hjarde (6,7), at the State Vitamin Laboratorium in Copenhagen, Denmark, have proposed the following sequence of procedures for the determination of tocopherol in oils, foods and feeding stuffs:

Saponification with pyrogallol, extraction into ether, column chromatography through secondary magnesium phosphate to separate the tocopherols from carotenoids, vitamin A, sterols and other reducing substances, as well as to partially separate the tocopherols, and reading with ferric chloride-dipyridyl. As this absorbant (7) separates the tocopherols into fractions similar in composition to the spots on zinc ammine papers, it could be expected that certain naturally occurring reduced coenzyme Q may also separate with the tocopherols and react in the subsequent ferric chloride-dipyridyl reaction (5).

Blood plasma and serum need only be extracted, saponified, hydrogenated or chromatographed and read with ferric chloride-dipyridyl in ethanol (2,15). If the blood has a low fat content (74) or if the readings are made in a better fat solvent than ethanol, such as cyclohexane-ethanol (70), saponification can be bypassed. If the blood has no carotenoids (sheep and rat blood), and if the tocopherol is to be measured by the ferric chloride-dipyridyl method, the plasma extracts do not have to be hydrogenated or chromatographed (4).

Milk Analyzation

Milk can be analyzed for tocopherol by extraction, hydrogenation and reading in cyclohexane-ethanol with the ferric chloride-dipyridyl reagents (70).

As most animal tissues contain more interfering substances than do blood plasma and most feeds, more elaborate procedures of purification are needed to determine their tocopherol content. At the University of Connecticut, we use a continuous Soxhlet-type extraction with ethanol for 20 hours (76), molecular distillation (76), chromatography through stannous chloride treated florex XXS (8,55,85) and reading with ferric chloride-dipyridyl (76). All animal tissues with high fat content, such as eggs, adipose tissue and feeds, are saponified at the termination of extraction in the atmosphere of ethanol,

then acidified and treated further as above for other animal tissues.

BIOASSAY — The classical bioassay is fetal resorption in rats (40, 41,42,48,49,58,62,84,90). Female rats are reared from the 14th day of age on a vitamin E free diet (58,62). When they achieve a weight of 150 gms., they are mated to fertile males and fertilization is ascertained by vaginal smears to detect the presence of spermatozoa. Four different levels of each vitamin E supplement are fed to one of four groups of pregnant rats. The vitamin E supplement is fed on the fourth, fifth, sixth, seventh and eighth days of pregnancy in the food or in olive oil fed orally from a calibrated dropper.

On the 20th day of pregnancy, the rats are killed for uterus examination. Only those animals having at least four implantation sites are used. All rats with one or more viable fetuses are recorded as positive, while all rats with no living young are recorded as negative. The per cent litter efficiency for a particular dose of vitamin E is calculated and transformed into probits. A plot of the probits against dose or log of dose gives the median fertility dose or dose of the vitamin E supplement that gives a 50% litter efficiency. A ratio of the median fertility dose for the standard supplement to the median fertility dose for the test supplement gives the relative biopotency of these vitamin E preparations for the rat.

Other anti-sterility bioassays have utilized the relative increase in weight of the tocopherol deficient pregnant rats fed a tocopherol supplement during pregnancy (34), the degree of pigmentation of the uterus of vitamin E deficient rats fed graded levels of different vitamin E supplements (88) and the degree of testicular degeneration as shown by weight (88) or histological examination (30) of the testes of male rats fed diets containing graded levels of different vitamin E supplements.

A second bioassay method involves the cure of muscular dystrophy in rabbits (46). After rabbits on a vitamin E deficient diet developed a creatinuria ratio of 4, a test dose of vitamin E was given. The number of days between dosage and the time before the creatinuria ratio rose again to 4 was taken as the response. The plot of the number of days of response against the log of the dose gave a linear relationship. A comparison of the slopes obtained using different forms of tocopherol supplements gave their relative utilization. The occurrence of dystrophic lesions in the thigh musculature of the rat also has been used to indicate the relative biopotency of different tocopherols (30).

A third bioassay method involves the protection of the red blood cells of vitamin E depleted rats against dialuric acid hemolysis (33,80) by a single test dose of tocopherol. Rats were fed a vitamin E deficient diet until they showed 100% hemolysis in the dialuric acid test, then they were given a single test dose that from previous experience gave a 50% reduction in the dialuric acid hemolysis of the blood taken 2 days after supplementation.

Only those rats showing a per cent hemolysis of less than 80% and greater than 20% were used in the later bioassay (33). These rats were again depleted of vitamin E until they again showed 100% hemolysis in the dialuric acid test, then they were fed one of each of three test doses of each of the vitamin E supplements under test. Each test dose was fed by syringe in .5 ml. of olive oil. The per cent hemolysis was determined on the second day after dosing, converted to the arcsine and plotted against the log of the dose to obtain a linear relationship. The slopes of the lines for the respective vitamin E supplements were compared to determine their relative biopotencies. This bioassay method is very precise (33).

Fourth Bioassay

A fourth general type of bioassay is the relative increase in tissue levels of tocopherol caused by feeding graded levels of the respective tocopherol supplements. The precision of this bioassay can be kept high by: (1) Selection of the tissue for analysis (4, 39, 61); (2) depleting the animals of tocopherol before supplementation; (3) selection of the levels of tocopherol to be fed; (4) selection of the method by which the tissues are to be analyzed for tocopherol, and (5) prevention of loss of vitamin E during storage of the tissues before analysis (16). This bioassay technique for human beings involved the relative increase in blood serum tocopherol content up to 24 hours after the different forms of tocopherol were fed (31,89). The relative biopotencies of several of the tocopherols have been determined by the increase in tocopherol content of the eggs of hens previously depleted of vitamin E (17). The deposition of tocopherol in the body fat of rats fed three of the tocopherols indicated the relative biopotencies of these tocopherols (59). The increase in the liver level of tocopherol after feeding graded levels of several forms of tocopherol has been used as a bioassay technique with both the rat (4) and the chick (10,79). Not only is this bioassay method using tissue levels of tocopherols widely applicable to the various species of animals, but it also is very precise (79).

TABLE 1. The Relative Biopotency of Various Forms of Alpha-Tocopherol

Form of Tocopherol	M.F.D. Rat	Per Cent Hemolysis Rat	Creatinuria Ratio Rabbit	Plasma Tocopherol Human	Liver Tocopherol Chick
dl-Tocolacetate	100(42)*	100(33)	.....	100(89)	100(79)
dl-Tocopherol	42(42)	102(33)	100(46)	135(89)	101(79)
d-Tocopherol	86(42)	133(33)	122(46)	.....	.....
d-Tocolacetate	136(42)	147(33)	.....	.....	130(79)
d-Tocolsuccinate	136(42)	114(33)	.....	.....	.....

*Literature reference in parentheses.

These various bioassay procedures have shown (Table 1) that the synthetic or dl tocopherols are less potent that the natural or d tocopherols (33,40,41,46,49,79), and that the succinate may be less available to the rat than the acetate esters of tocopherol (33). By some bioassay methods the esterified tocopherols are more potent than the free form, as shown by the medium fertility dose for rats (42), but in other cases the free and esterified forms have the same potency, as shown by % hemolysis in the rat (33) and levels of

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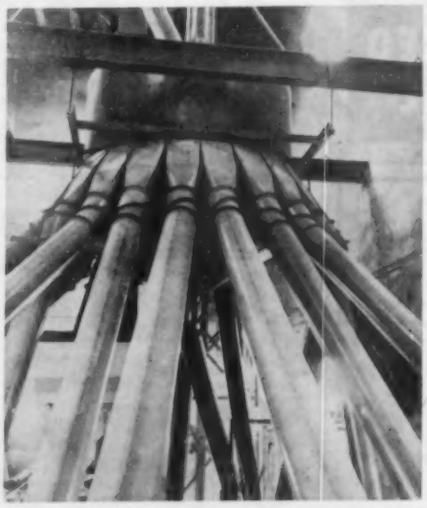

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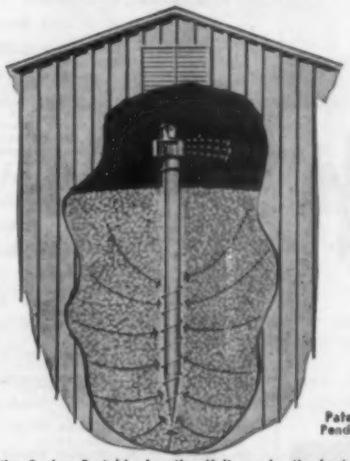

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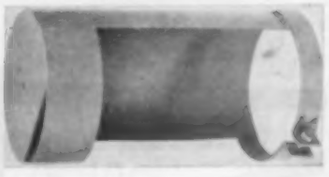

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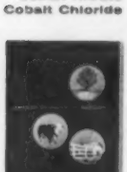

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TABLE 2. The Relative Biopotency of Various Tocopherols

Form	Anti-sterility Rat	Per Cent Hemolysis	Creatinuria Ratio Rabbit	Egg Tocopherol Hen	Liver Tocopherol Rat
dl-alpha	100(34)*	.....	100(46)	.....	100(4)
dl-beta	25(34)	.....	.....	.....	.....
dl-gamma	19(34)	.....	8(46)	.....	.....
dl-zeta	52(12)	.....	.....	.....	50(4)
dl-eta	3(11)	.....	.....	.....	.....
d-alpha	100(49)	100(80)	100(46)	100(17)	.....
d-beta	40(49)	15(80)	30(46)	.....	.....
d-gamma	8(49)&1(90)	3(80)&15(33)	20†(46)	25(17)	8(4)
d-delta	<1(84)	2(80)	.....	10(17)	.....
d-epsilon	<8(88)	.....	.....	.....	.....

*Literature reference in parentheses.
†Sample probably contaminated with alpha.

tocopherol in the blood of infants (31) and livers of chicks (79). However, the esterified tocopherol is utilized by the adult human being less readily than is the free form (Table 1) (89).

Alpha-tocopherol is by far the most biologically available form (Table 2) (4, 11, 12, 30, 34, 46, 49,59,80,84,88,90). Also, one sample of gamma-tocopherol (Table 2) was suspected to contain alpha-tocopherol (46) and other samples of the tocopherols may have contained some alpha-tocopherol (90), which would have caused higher results and may explain the disagreement among bioassays of the same tocopherol done by different workers. Other workers (33) have obtained pure samples of a-tocopherol containing as little as 93% tocopherol. This would suggest that methods for analysis of pure samples of tocopherol (both synthetic and natural) need to be used routinely. Highly potent samples of tocopherol can be analyzed by ceric sulfate titration (58) and the ferric chloride-dipyridyl reaction (58). All the pure natural tocopherols would have to be analyzed after two dimensional paper chromatography to check for the presence of other tocopherols (1).

v v

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SUGGESTIONS

(Continued from page 30)

rect sunlight. However, pigs self-fed the minerals, plus the same corn-soybean oil meal ration did not consume enough calcium to meet their needs. Vitamin D supplementation benefited the pigs self-fed their minerals. It is recommended that rations contain at least the vitamin D levels suggested in Tables 1 and 2, even though vitamin D was of no benefit in the South Dakota study. Evidently, vitamin D needs are minimized when the various mineral elements and ratios are correct.

Riboflavin—The levels shown in Tables 1 and 2 should be adequate and are higher than some investigators have shown to be needed (7). On the other hand, a few investigators have shown a need near the levels recommended in Tables 1 and 2 (7). Thus, in some cases this may be more riboflavin than needed, but to be on the safe side, the higher levels are suggested since a few think that even higher levels might occasionally be needed.

Pantothenic Acid—The levels shown in Tables 1 and 2 are just about right since recent work has shown that the young pig needs about 6 mg. of pantothenic acid per pound of feed (7). Some investigators will recommend slightly lower levels, but the writer feels that anyone using lower levels will run the risk of inadequate pantothenic acid for some pigs under certain conditions.

Niacin—The levels shown in Tables 1 and 2 should supply the needs of the pig. Since niacin is very reasonable in price, many investigators will recommend the use of higher levels of niacin. The tryptophan content of the ration will influence niacin needs since the pig can use tryptophan to make niacin (7). If the tryptophan level in the ration is high enough, it is difficult to produce a niacin deficiency.

Recently, English workers (23) reported that corn, in common with other cereals, has all, or almost all, its niacin in "bound" form which is unavailable to microorganisms, rats and pigs. If this is the case, then the intake of tryptophan has to be considered as a potential source of niacin since the pig can convert tryptophan to niacin. Thus, "bound niacin" would affect both the niacin and tryptophan requirements of the pig. This report points up the need for studies in the U.S. to verify these data. Until more information is obtained on "bound niacin," it would be a good policy to add enough extra niacin to grain rations so that the niacin in the grain is not depended upon.

Vitamin B_{12}—The only modification of the suggested levels shown in Table 1 might be an increase from 7-10 mcg. lb. for the 25-lb. pig. This might be helpful under certain conditions where some extra B_{12} would prove beneficial—such as with poor doing pigs or where the sow ration was borderline in providing enough B_{12} for the suckling pig.

Antibiotics—Table 5 gives the recommended antibiotic levels to use. Under certain stress factor conditions, higher levels may be needed. The recommended levels may also vary depending upon the antibiotics as well as the rations which are used. In the writer's opinion, pigs fed the effective antibiotics grow as rapidly today as pigs fed similar rations in past years. Actually, what has happened is that the control pigs are doing better and narrowing the difference due to antibiotic feeding. This is most likely due to the cleaning up of contamination from growth-inhibiting microorganisms by the antibiotics in the quarters where they have been used continuously. It is felt by many that if antibiotic feeding were discontinued, the pigs not fed antibiotics would revert to the previous performance of pre-antibiotic years. Thus, on the basis of present knowledge their continued use is recommended.

There is some evidence to indicate that the feeding of antibiotics to pregnant sows at levels of 10-15 mg. per lb. of ration may increase the birth weight, liveability and weaning weight of pigs. Under average farm conditions, where sanitation is not always too good, where the ration is not always well balanced and where other stress factors may be high, it is very possible that antibiotics will be beneficial in sow rations.

Recent studies indicate that a combination of an antibiotic and an arsenical is more effective against certain cases of scours than either supplement alone.

At the present there are not sufficient data to conclude that combinations of antibiotics are usually more effective than any single one used at the correct level. There are, however, some indications that combinations of antibiotics may be more effective under certain conditions.

Arsenicals and Other Antibacterial Compounds—Arsenicals are increasingly being used in swine feeds. They have been shown to increase rate of gain and feed efficiency. Certain ones of them are also very effective in the control of bloody dysentery. Minnesota (24) and Ohio workers (25) have shown that a level of .05% of arsanilic acid in a protein supplement to be

TABLE 5. Recommended Antibiotic Levels*

	Pig weight lb.	Antibiotic level grams
		Per ton of complete feed
Baby pigs	10	40
Baby pigs	25	40
Growing pigs	50	10-20
Finishing pigs	100-200	10
Therapeutic level for poor doing pigs		50-100†
		Per ton of Supplement
Supplement to be fed free-choice with grain		50-80

†If pigs are in very poor condition and will not eat, then antibiotic can be given in the drinking water.
*Recommendations of National Research Council Committee on "Nutrient Requirements of Swine" in 1959 (1).

PANTOTHENIC ACID DEFICIENCY—This deficiency occurs on many farms. Most rations are deficient or borderline in pantothenic acid. (Courtesy H. Heitman, Jr., California Agricultural Experiment Station)

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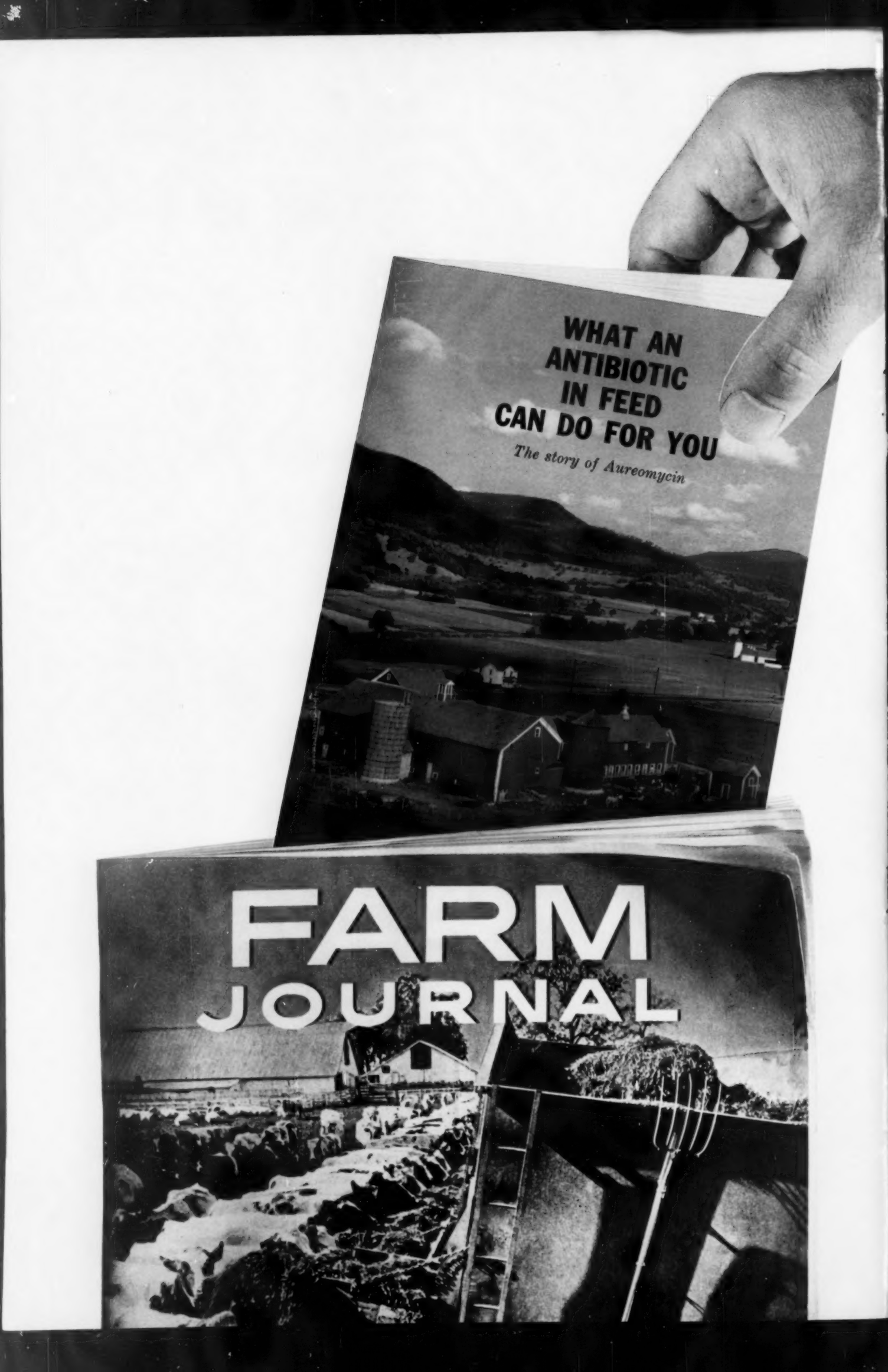
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used for free-choice feeding with grain gives good results. The Purdue station (26) obtained good results with arsanilic acid at a level of 90 gm. per ton of total ration. The Iowa station (27) has used a level of .0025% of 3-nitro-4-hydroxyphenylarsonic in the ration with good results.

These levels of arsenicals in the rations should be used as guides. Arsenicals are toxic compounds when fed in excess. Thus, one needs to be careful in using them, since there is a fairly narrow range between toxic levels and those needed for optimum growth and control of scours.

Many feed companies are now using a combination of an arsenical and an antibiotic, particularly where enteric disorders, other diseases and stress factor conditions are apt to occur.

Other antibacterial compounds such as furazolidone and a combination of streptomycin-sulfaquinoxaline have been helpful in some experiments (28). However, more studies are needed with those and other compounds to determine more adequately their role in the nutrition of the pig as well as in the control of enteric infections.

♥ ♥

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Merck to Publish Chemical Reference

RAHWAY, N.J.—The forthcoming seventh edition of the Merck Index, chemical reference book, will be 400 pages larger than its predecessor and will contain several features, including a Russian alphabet. It is scheduled for publication in March.

An encyclopedia of chemicals and drugs, the Index has been published by the Merck organization for more than 65 years. It is said to be a standard reference work for chemists, pharmacists, physicians, dentists, veterinarians, botanists, and members of allied professions. More than 100 000 copies of the sixth edition have been sold since its publication in 1952.

The prepublication price in the U.S. is $11. After publication, the price will be $12. Orders may be addressed to Publications Department, Merck & Co., Inc., or placed with technical book dealers.

The new edition contains 1.600 pages of text covering nearly 10,000 descriptions of individual substances, more than 3.300 structural formulas, and about 30.000 names of chemicals and drugs alphabetically arranged and cross-indexed—10,000 more than its predecessor.

Forage Is Evaluated

AMHERST, MASS. — There has been a great response to the new forage evaluation part of the Massachusetts Winter Dairy Feed Program, the state committee said.

To date, more than 300 samples of hay, grass silage and corn silage have been analyzed for quality at the University of Massachusetts. The testing program is designed to aid dairymen in determining the feed value of their forage and in adjusting the feeding program according to herd needs.

How To Make Your Elevator Meet Growing Storage Needs For Years To Come!

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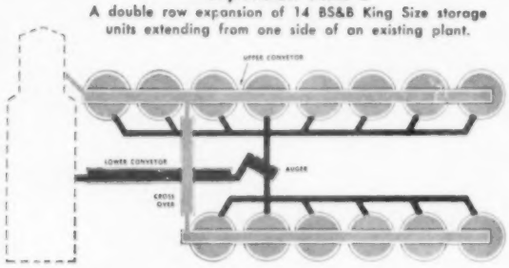
Expansion Plan L
A double row expansion of 14 BS&B King Size storage units extending from one side of an existing plant.



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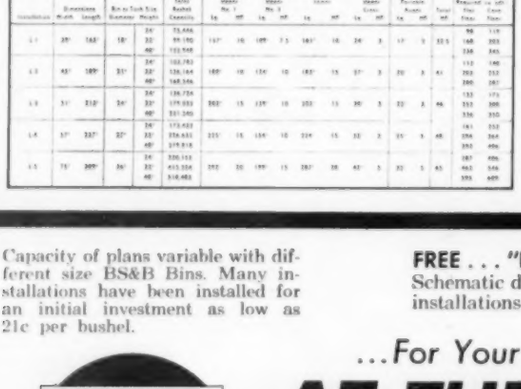
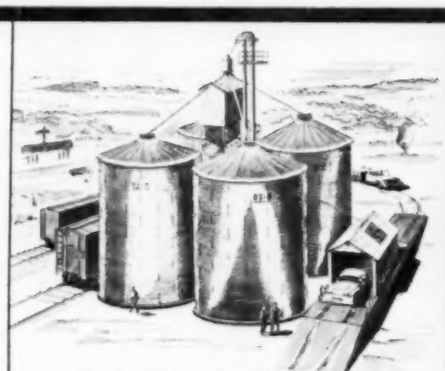
To identify the installation which conforms to your particular space and capacity requirements, select the plan with installation dimensions corresponding to the size of the actual expansion space you have available.





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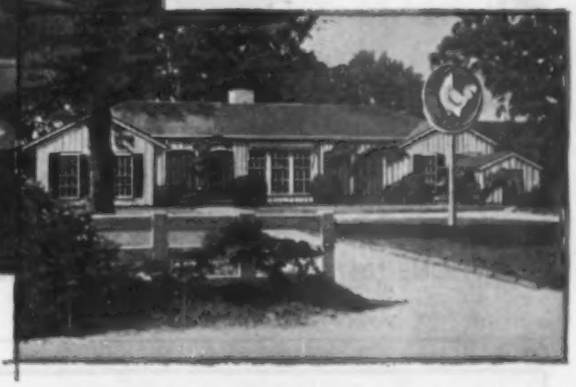

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- Reversible at flip of switch
- Sizes—10 to 21 ft.

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A heavy-duty portable, folding conveyor, built for long life.

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Convention Calendar

New Listings

For the convenience of readers who scan the Convention Calendar regularly for new listings, those added to the column in the current week appear separately from ones which have been entered previously. The following week they will be moved to their proper slot where they will remain until the event is held.

Feb. 24—Purdue Marketing Clinic; Purdue Memorial Center and Purdue Memorial Union, Purdue University, Lafayette, Ind.; R. B. Wilson, Department of Agricultural Economics.

Feb. 25-26—Northeastern Poultry Producers Council Business Management Workshop for Egg and Poultry Cooperatives; Willard Hotel, Washington, D.C.; Alfred Van Wagenen, 10 Rutgers Place, Trenton 8, N.J.

March 27-29 — Colorado Grain, Milling & Feed Dealers Assn.; Shirley-Savoy Hotel, Denver; sec., O. W. Eriksen, 519 Boston Bldg., Denver 2.

April 21—New England Dairy Feed Conference; Hotel Lenox, Boston, Mass.; chm., Dr. Stanley N. Gaunt, Dairy and Animal Science Dept., College of Agriculture, University of Massachusetts, Amherst.

June 21-22—Association of Southern Feed & Fertilizer Control Officials; Riverside Hotel, Gatlinburg, Tenn.; sec., Maurice B. Rowe, Department of Agriculture, 1119 State Office Bldg., Richmond 19, Va.

June 23-24—Northeastern Poultry Producers Council Business Management Conference for Egg and Poultry Marketing Cooperatives; Hotel Viking, Newport, Rhode Island; Alfred Van Wagenen, 10 Rutgers Place, Trenton 8, N.J.

Oct. 4-6 — Northeastern Poultry Producers Council; Exposition and Convention; Onondaga County War Memorial Bldg., Syracuse, N.Y.; Doris Endebrock, Exposition Mgr., 10 Rutgers Place, Trenton 8, N.J.

Oct. 27-28—National Swine Industry Conference; University of Kentucky, Lexington.

1961

Jan. 13—South Carolina Poultry Festival; Batesburg - Leesville; sec., W. E. Sanders, Batesburg.

Feb. 15-17—Farmers Elevator Association of Minnesota; Pick-Nicollet Hotel, Minneapolis; sec., Lloyd A. Nelson, Grain Exchange Bldg., Minneapolis.

Feb. 18—Minnesota Sheep and Lamb Day; West Central Experiment Station, Morris, Minn.; Dr. R. M. Jordan, Animal Husbandry Dept., University of Minnesota, St. Paul.

Feb. 21-23 — Ohio Grain & Feed Dealers Assn.; Commodore Perry Hotel, Toledo; sec., George G. Greenleaf, 5625 N. High St., P.O. Box 121, Worthington, Ohio.

Feb. 22 — New Mexico Feeders' Day; New Mexico State University, State College; chm., Dr. John H. Knox, Animal Husbandry Dept., University Park, N.M.

Feb. 22-25 — Colorado Livestock Days; Colorado State University, Fort Collins; chm., Paul S. Pattengale, Extension Animal Husbandman.

Feb. 22-25—Mississippi Swine Short Course; Mississippi State University, State College; Dean and Director, Division of Agriculture.

Feb. 23-24—Virginia Feed & Nutrition Conference; Hotel Roanoke, Roanoke; J. Paul Williams, sec., Virginia State Feed Assn., 615 E. Franklin St., Richmond, Va., or Prof. Paul M. Reaves, Department of Dairy Science, Virginia Polytechnic Institute, Blacksburg, Va.

Feb. 25 — Iowa Swine Producers Conference; Iowa State University, Ames; William Zmolek, Animal Husbandry Dept.

Feb. 25-27 — North Dakota Grain Dealers Assn.; Municipal Auditorium, Fargo; sec., Lloyd Hanson, 513 Black Bldg., Fargo.

Feb. 25-26—South Carolina Poultry Disease and Management Short Course; Clemson College, Clemson, S.C.; Dr. B. D. Barnett, head, Poultry Dept.

March 3—Illinois Swine Day; Uninois, Urbana; K. E. Harshbarger, Dairy Science Dept.

March 3—Illinois State Turkey Growers Assn.; Winter Meeting, University of Illinois, Urbana; sec., S. B. Swann, Kauffman Turkey Farms, Waterman, Ill.

March 3—Illinois Swine Day; University of Illinois, College of Agriculture, Urbana; Harry G. Russell, Livestock Extension Specialist.

March 7-8—Grain & Feed Dealers National Assn.; Hotel Muehlebach, Kansas City; sec., Herbert L. Sharp.

Tom Letch put aside his editor's cap with a weekly newspaper in a farming community to join the staff of The Miller Publishing Company. His grass roots knowledge of farming and agricultural marketing gives him a practical approach to the problems that may be confronting you.

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March 9—Mutual Millers & Feed Dealers Assn.; Statler-Hilton Hotel, Buffalo, N.Y.; sec., Mrs. Donald E. Mattison, Box 8, Cattaraugus, N.Y.

March 17-18—Oregon Feed & Seed Dealers Assn.; New Sheraton Hotel, Portland, Ore.; mgr., Russ Hays, 702 Lewis Bldg., Portland, Ore.

March 17-18—Maryland Nutrition Conference; Shoreham Hotel, Washington, D.C.; chm., Richard D. Creek, University of Maryland, Department of Poultry Husbandry, College Park.

March 23—Distillers Feed Conference; Sheraton Gibson Hotel, Cincinnati; sponsored by Distillers Feed Research Council; exec. director, Dr. Lawrence E. Carpenter, 1232 Enquirer Bldg., Cincinnati, Ohio.

March 23-24—National Broiler Industry Conference; Dinkler-Plaza Hotel, Atlanta, Ga.; vice pres., Frank Frazier, P.O. Box 368, Richmond, Va.

March 29—New Jersey Poultry Nutrition Institute; Rutgers University, New Brunswick, N.J.; R. L. Squibb, chairman, Poultry Science Department.

March 31-April 2—Pacific Dairy & Poultry Assn. Exposition and Convention; Stardust Hotel, Las Vegas, Nev.; association office, 1304 E. 7th St., Los Angeles 21, Cal.

April 1-2—Texas Grain & Feed Assn., Shamrock Hotel, Houston; sec., Ray B. Bowden, 407 Fort Worth Club Bldg., Ft. Worth, Texas.

April 5-7—Nebraska Grain & Feed Dealers Assn.; Pershing Municipal Auditorium, Lincoln; sec., Howard W. Elm, Trust Bldg., Lincoln, Neb.

April 6—Purdue Egg Day; Purdue University, Lafayette, Ind.; David D. Jackson, Extension Poultryman.

April 11-13—Poultry and Egg National Board, LaSalle Hotel, Chicago, Ill.; mgr., Floyd Geil, 8 S. Michigan Ave., Chicago 13, Ill.

April 17-19—Animal Health Institute; Shoreham Hotel, Washington, D. C.; sec., D. L. Bruner, 512 Shops Bldg., Des Moines 9, Iowa.

April 22—Indiana Cattle Feeders Day; Purdue University, Lafayette, Ind.; chm., Dr. W. M. Beeson, Animal Science Dept.

April 21-23—California Hay, Grain & Feed Dealers Assn.; Ambassador Hotel, Los Angeles; sec., John Gilmore, Blue Anchor Bldg., 1400 10th St., Sacramento 14, Cal.

April 21-23—Kansas Grain & Feed Dealers Assn.; Broadview Hotel, Wichita, Kansas; sec., Orris E. Case, 609 Wiley Bldg., Hutchinson, Kansas.

April 22—Nebraska Livestock Feeders Day; University of Nebraska, College of Agriculture, Lincoln; chm., Wm. J. Loeffel, Animal Husbandry Dept., Lincoln 3, Neb.

May 1-4—National Fisheries Institute; Hotel Fontainebleau, Miami Beach, Fla.; asst. gen. mgr., Mal Xavier, 1614 20th St. N.W., Washington 9, D.C.

May 9-11—American Feed Manufacturers Assn.; Conrad Hilton Hotel, Chicago; sec., W. T. Diamond, 53 W. Jackson Blvd., Chicago 4, Ill.

May 9-11—Association of American Feed Control Officials; Sheraton-Blackstone Hotel, Chicago; sec., Bruce Poundstone, Feed and Fertilizer Dept., Agricultural Experiment Station Bldg., University of Kentucky, Lexington.

May 15-17—National Cottonseed Products Assn.; Roosevelt Hotel, New Orleans, La.; sec., John F. Moloney, Box 5736, Memphis 4, Tenn.

June 12-14—Eastern Federation of Feed Merchants, Inc.; Whiteface Inn, Lake Placid, N.Y.; exec. director, Austin W. Carpenter, Sherburne, N.Y.

June 13-15—American Association of Feed Microscopists; Hilton Hotel, San Antonio, Texas; sec., G. M. Barnhart, Missouri Department of Agriculture, Jefferson City, Mo.

June 14-15—Alabama Poultry Industry Assn.; Municipal Auditorium (Exhibits) and Thomas Jefferson Hotel, Birmingham, Ala.; sec., W. L. Walsh, Box 567, Montgomery.

June 14-17—NEPPCO Egg Quality School; Rutgers University, New Brunswick, N.J.; Dr. A. Van Wagenen, NEPPCO, 10 Rutgers Place, Trenton 8, N.J.

June 19-21—Indiana Grain & Feed Dealers Assn.; Mid-Summer Convention; French Lick-Sheraton Hotel, French Lick; sec. Fred K. Sale, 600 Board of Trade Bldg., Indianapolis 4.

July 23-26—Georgia Feed Assn.; General Oglethorpe Hotel, Wilmington Island, Savannah; sec., Will L. Kinard, Suite 210, 3240 Peachtree Road Bldg., Atlanta 5, Ga.

Aug. 2-5—Poultry Science Assn.; University of California, Davis; sec., C. B. Ryan, Texas A&M College, College Station.

Sept. 1-6—International Congress on Nutrition; Sheraton-Park Hotel, Washington, D.C.; sponsored by International Union of Nutritional Sciences; sec., Milton O. Lee, 9650 Wis-

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ST. LOUIS EXCHANGE—The 1960 officers of the Merchants Exchange of St. Louis, recently elected, are congratulated by Kurt Horn, Continental Grain Co., retiring president (second from the left). Left to right are N. D. Seele, Service Grain Co., second vice president; Mr. Horn; Keith E. Morrison, Dixie Mills Co., president, and J. W. Hogan, Ralston Purina Co., first vice president.

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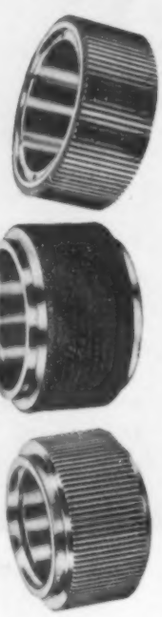

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Sept. 14-16—National Feed Ingredients Assn.; Liggetts Holiday Inn, Burlington, Wis.; sec., Paul W. Bonewitz, 1023 Equitable Bldg., Des Moines, Iowa.

Sept. 21-23 — Feed Production School; Continental Hotel, Kansas City; sponsored by Feed Production School, Inc.; pres., Lloyd Larson, 20 W. 9th St. Bldg., Kansas City 5, Mo.

Sept. 22-23 — Arkansas Formula Feed Conference; University of Arkansas, Fayetteville; chm., Dr. E. L. Stephenson, Department of Animal Industry and Veterinary Science.

Oct. 5-7—Texas Nutrition Conference, Texas A&M College Station; chm., Dr. J. R. Couch, Department of Poultry Science.

Oct. 11-12—Virginia State Poultry Federation convention and trade show; Hotel Roanoke, Roanoke, Virginia; sec., J. Paul Williams, 615 East Franklin Street, Richmond 19.

Oct. 12-13 — Association of American Feed Control Officials Annual Meeting; Shoreham Hotel, Washington, D.C.; sec., Bruce Poundstone, Feed and Fertilizer Dept., Agricultural Experiment Station Bldg., University of Kentucky, Lexington.

Nov. 2-3—Illinois Feed Assn.-Illinois Poultry & Hatchery Federation, joint convention; Springfield Armory, Springfield; sec., IFA, Dean M. Clark, 141 W. Jackson Blvd., Chicago 4; sec., IPHF, Aubrey Harless, Shelbyville, Ill.

Nov. 2-3—Kansas Poultry Assn.; Broadview Hotel, Wichita; sec., Harry J. Reed, Box 663, Manhattan.

Nov. 16-17—Missouri Poultry Improvement Assn.; Hotel Continental, Kansas City; sec., E. M. Funk, Columbia, Missouri.

1961

Jan. 12-13—Michigan Feed & Grain Dealers Assn.; Michigan State University, Kellogg Center; sec., Nevel Pearson, P.O. Box 472, East Lansing.

Young Machinery Co. Buys Robinson Firm

PENNSDALE, PA. — Young Machinery Co., Inc., has acquired the entire plant and manufacturing facilities of Robinson Manufacturing Co. in Muncy, Pa., according to Henry T. Young, president.

The Pennsdale plant, near Muncy, manufactures pneumatic conveying and mixing systems for use in the chemical, pulp and paper, feed and flour, and plastics industries. The Robinson firm manufactures a similar but additional line of equipment.

Young Machinery Sales Co., Inc., with William J. Geist as president, will continue to act as exclusive sales agent for the combined facilities.

True D. Morse Predicts Dairy Income Will Reach Record High

BOYS TOWN, NEB. — Dairy income this year will reach a record high, delegates to the annual meeting of the Nebraska-Iowa Cooperative Milk Assn. were told.

The speaker was True D. Morse, under secretary of agriculture.

Milk and butterfat prices to farmers probably will be above 1959 levels for a considerable period, he said.

"The downturn of milk production in the last two years, following five years of new production records," he said, "has brought a better balance between production and market demand."

In contrast to unsound attempts to fix prices at artificial levels, Mr. Morse said, dairy progress is a dramatic illustration of how farmers are helped with a realistic price-stabilization program.

A few years ago more than 250 million pounds of butter, 460 million pounds of cheese and 650 million pounds of dry milk had piled up in government storage, he said.

"All of these surplus stocks have been liquidated or committed for use for schools and needy people. They no longer hang over the markets."

He called the outlook for dairying "one of the bright spots for the year ahead."

Flemming Criticized

Arthur Flemming, secretary of health, education and welfare, was criticized by an official of the National Milk Producers Federation for "headline hunting" in the recent "cranberry scare" and other food seizures.

Patrick B. Healy, Washington, assistant secretary of the federation, said Mr. Flemming, "in overplaying what are usually routine food seizures, needlessly alarmed consumers and seriously harmed various segments of the food industry."

"In recent instances," Mr. Healy said, "from cranberries to caponettes, there remains doubt that danger to health was sufficiently imminent to justify the scare-statements."

FEED COMPANY SOLD

NEW SHARON, IOWA — The Taintor (Iowa) Cooperative Co. has purchased and taken over the operation of the Peterson Grain Co., New Sharon, from E. H. Klinzman, longtime owner. The local feed company is now being operated under the name of the Taintor Cooperative Co. with Glen Gerard, manager with Maurice Adkisson, formerly of the Peterson Grain Co. as assistant.

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It's pure economics . . . CUT your cost . . . increase your profit. Compare the cost of JOHN DEERE FEED UREA with other sources of protein. You'll quickly see how you can start increasing your profit right away. What's more, you can maintain your quality . . . even give your feeders extra benefits by using JOHN DEERE UREA in your beef and dairy feeds. Take advantage of this product of modern science.

JOHN DEERE UREA is 262% protein equivalent . . . its uniform flow insures the same amount of protein in every pellet and cube.

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Quality you know... a name you trust!

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Grand River Chemical Division of
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UP OR DOWN

By Dr. Leonard W. Schruben, Agricultural Economist, Kansas State College

Seasonal Lamb Prices

What are the chances that lamb prices will advance between now and April? What does this mean in terms of farmers' willingness to buy commercial feed?

Over the past years lamb prices have shown a consistent tendency to advance from February through the months of April and May. It appears as though this tendency for slaughter lamb prices to advance in the spring months has a good chance of being followed again this year.

To give you an idea of past patterns in the market place we have prepared Exhibit 1. This exhibit shows the per cent of times prices have gone up, stayed the same or gone down from February to April, to June and to August.

Here is how to read Exhibit 1. The top part of the bar in the first column indicates the percentage of times that the Kansas farm price of lambs went up from February to April. You will notice that within the bar is written 92. This means that in 92% of the years from 1947 lamb prices advanced from mid-February to mid-April. The middle part of the bar indicates the percentage of the years prices remained the same, which in the case of the February-to-April comparison was 8%. The bottom part of the bar, if there is one, would show the percentage of times prices went down from February to April. You will notice that since 1947 Kansas lamb prices have not gone down from February to April.

Changes from February to June and from February to August are shown in the second and third bars of Exhibit 1 and are read in the same manner as is the first bar.

Fewer lambs were on feed in the U.S. on Jan. 1, 1960, than on same date last year, as is shown in Exhibit 2. Slightly over 4 million head were on feed, 7% less than a year earlier. There was considerable variation from state to state in accomplishing this decrease. Kansas, for example, cut back 37%, while Minnesota, Iowa, Onio and Michigan had more lambs on feed than a year earlier.

Sheep and lamb feeding seems to have been fairly well stabilized in the 1950's. You can see from Exhibit 2 that from 1930 to the mid-1940's, the sheep and lambs on feed Jan. 1 totaled about 6 million. Then the industry shrank in the late 1940's. Some recovery followed in 1952.

Will more manufactured feed be used for this market in future years? There isn't too much room to be optimistic as far as numbers to be fed are concerned. However, nutritional discoveries are always being made which could open a broader market through a higher rate of feeding. Have you explored thoroughly this market in your territory?

EXHIBIT 1. Changes in Kansas Lamb Prices from February, 1947-59

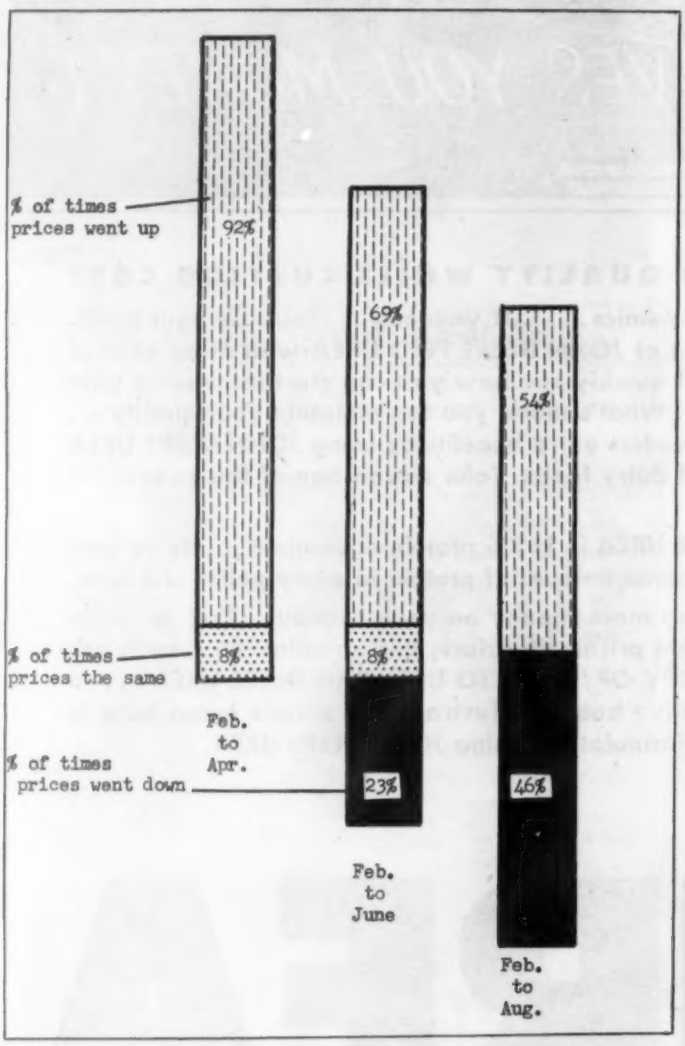
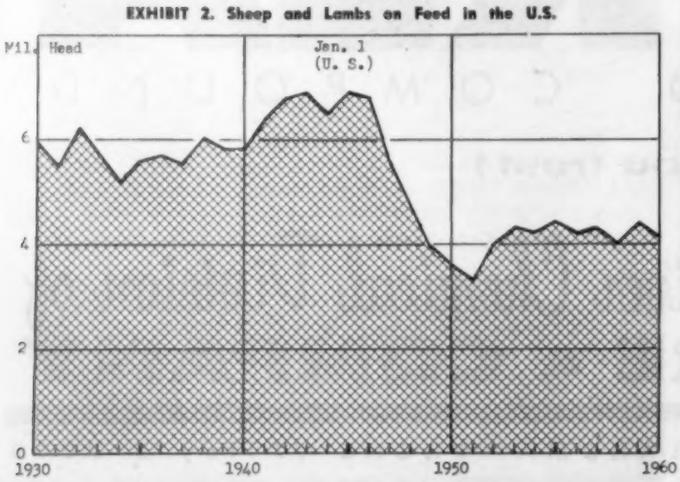


EXHIBIT 2. Sheep and Lambs on Feed in the U.S.



Named Dr. Salsbury's Industry Service Head

CHARLES CITY, IOWA — Dr. Owen L. Thompson, technical service representative for Dr. Salsbury's Laboratories, has been appointed manager of the firm's industry services department. He succeeds the late Dr. James F. Harr.

Dr. O. L. Thompson

As head of the industry services department, Dr. Thompson will direct the activities of personnel in education, industry public relations and technical service.

He received a bachelor of science degree in bacteriology from Utah State University in 1954, then served for a year in the institution's animal diagnostic laboratory. His doctor of veterinary medicine degree was awarded in 1959 by Washington State University.

Soy Meal Demand May Continue High

WASHINGTON—Demand for soybean meal is expected to continue high through the remainder of the feeding year with a price decline from the January level, according to a U.S. Department of Agriculture Fats and Oils Situation report. Cottonseed meal prices probably will not average as high as the $61 per ton during January-August, 1959, either, the Agricultural Marketing Service points out.

Although soybean meal prices may decline for the remainder of the feeding year, they probably will average at least as high as the $56 a ton during January - September, 1959, USDA adds.

The continued high demand for soybean meal is expected mainly because of the large number of livestock and poultry and a heavy feeding rate per animal unit. Also, exports in 1959-60 are expected to rise well above the 512,000 tons in 1958-59. This would primarily reflect increased needs for imports into western Europe, caused by drouth and the inability to get larger supplies from key areas other than the U.S.

Soybean meal prices (bulk, Decatur) in October-December, 1959, averaged about $58 per ton, about $2.50 above the previous year. Prices in mid-January at $63 per ton were about the same as January, 1959.

Prices of cottonseed meal (bulk, Memphis) in August - December, 1959, averaged $57 per ton compared with $58 in 1958. Cottonseed meal prices in mid-January, 1960, were about $10 below January, 1959, the high month for the 1958-59 season.

Cottonseed meal prices are expected to remain firm through the rest of the crop year, but probably will not average as high as the January-August, 1959, level. Demand in the Southwest probably will be strong, since January 1 hay stocks in that area were down from a year earlier, and more cattle are on feed. However, much will depend upon pasture conditions this spring and summer.

Dr. B. S. Schweigert To Join Michigan State

EAST LANSING, MICH. — Dr. Bernard S. Schweigert has been named to head the college of agriculture's new department of food science at Michigan State University. Dr. Schweigert is now director of research and education for the American Meat Institute Foundation, Chicago.

The board of trustees of the university approved the framework for the new department several months ago which would combine the work involved in the processing of agricultural products into a single department. Dr. Thomas K. Cowden, dean of agriculture, says this is "another effort to strengthen the area of work between the farmer and consumer and to develop new products."

Some staff members working with food processing in the departments of horticulture, animal husbandry, dairy husbandry, poultry science, farm crops and agricultural engineering will be regrouped into the new department.

Dr. Schweigert, author or co-author of more than 150 scientific publications in the field of biochemistry, nutrition and meats research, will join the staff effective May 1, 1960. He earned B.S., M.S. and Ph.D. degrees from the University of Wisconsin in biochemistry and physiology from 1943 to 1946 and did teaching and research at Wisconsin and Texas A&M College before joining the American Meat Institute Foundation in 1948. He has been jointly associated with the University of Chicago while at the Meat Institute Foundation.

Developments, Techniques in Livestock Feeding Emphasized at Nevada Meeting

By DR. VERLE R. BOHMAN
University of Nevada

RENO, NEV.—New developments and techniques in livestock feeding were presented at the sixth annual Nevada Feed Conference held at the University of Nevada.

Dr. L. A. Underkofler, director, Enzymology Research Laboratory, Miles Chemical Co., pointed out the extremely variable results obtained with enzyme feeding tests with all species of livestock.

"The highly favorable responses obtained in some of the tests demonstrate that under certain conditions the addition of enzymes to the ration produces a dramatic increase in rate of gain of animals and in feed efficiency, and under such conditions, use of enzymes would have a distinct economic advantage," he said. "On the other hand, lack of response in other tests shows no advantage to be obtained in enzyme feeding under those conditions."

Much remains to be learned, he noted. "From present knowledge, it appears that best responses with enzymes are obtained with grains which are otherwise of inferior feeding value. This includes western barley, artificially dried grains, grains of low protein or energy content, and probably with animals under stress conditions. When grains of inferior feeding value are knowingly used, enzyme addition seems advantageous."

McKay McKinnon, director, San Francisco office, FDA, outlined the effect of the Delaney Amendment on the feed industry. He further noted that stilbestrol residues were found in treated poultry, but none has been found in tissues of beef cattle to date.

The history and problems of cattle feeding in Nevada were outlined by Norman Brown, livestock producer and president, Nevada State Cattle Assn. During the last 50 years, cattle feeding has changed from the use of alfalfa alone to rations involving mixed concentrates, by-product feeds and feed additives, he said. Bloat always has been a problem but can be controlled through judicious feeding.

University of Nevada scientists told of their research findings. Dr. D. W. Marble, veterinarian, explained the use of the transaminase test for detecting potential cases of white muscle disease (WMD) in lambs. Through the use of this test, several aspects of WMD have been studied.

"Creep feeding lambs with a vitamin E supplement has been found effective in preventing WMD in flocks where the disease is prevalent," he said. "Both oral and injectable selenium, when given to the ewe prior to lambing, prevents the occurrence of this disease. One injection of .03 to .10 g. of barium selenate proved effective in preventing WMD as measured by both transaminase and radio selenium in the blood of the sheep and lambs."

Alfalfa Pellets

Alfalfa pellets were effective supplements to native grass hay, reported Dr. V. R. Bohman, animal nutritionist. Calves fed native grass hay during the winter gained .66 lb. per day. Those receiving 3 and 6 lb. of alfalfa pellets, as a supplement to the hay, gained at the rate of 1.08 and 1.38 lb. per day, respectively, during the winter. Three pounds of a commercial supplement was no more effective than six of sun-cured alfalfa. After a period on summer range, cattle supplemented during the winter were 50 lb. heavier than non-supplemented controls. The amount and type of winter protein supplement had little effect on body weights following fall if a supplement was used. Dietary animal fat was not effective in promoting economical gains. Vitamin A deficiency was not evident or approached under these conditions.

Dr. H. J. Weeth, physiologist, has found that cattle can probably tolerate 1-1¼% salt in water as sodium chloride but larger amounts are detrimental to the animal. For short periods of time, up to 30 days, animals can probably tolerate up to 2% salt, but with distinct adverse physiological effects, he said.

Grazing cattle choose the type of feed that they eat, if they are given an opportunity to do so, reported A. L. Lesperance, Jr., animal nutritionist. Cattle preferred legumes to grass and thus consistently selected a diet high in protein and low in fiber. When the legumes were gone in a grass-legume mixture, the cattle were forced to eat the less nutritious grass. The data were obtained through the use of fistulated steers.

Copper and cobalt were found to be deficient in some Nevada forages. Occasional areas of molybdenum toxicity accentuated the copper problem. Most of Nevada forages have adequate amounts of mineral micronutrients required by livestock, stated W. B. Dye, agricultural chemistry department.

J. A. McCormick, superintendent, Newlands Field Station, Fallon, indicated that dairy calves could be effectively raised on high levels of good quality roughage and growth of these calves would compare favorably to the growth rates reported by the Beltsville and Missouri Standard curves. During early growth, only 4 lb. of alfalfa was required per pound of gain but at 2 years of age as much as 30 lb. was required.

FISH MEAL OUTPUT UP

WASHINGTON—Peru's fish meal industry continued to expand output rapidly in 1959. The country produced an estimated 285,000 tons of fish meal—more than double the 135,000 tons produced in 1958. Peru exported approximately 30,590 tons of fish meal to the U.S. in 1958, compared with 18,126 tons in 1957.

LOAN FUND—Shown presenting a check for $750 to Fred P. Jeffrey (center), chairman of the University of Massachusetts scholarship committee and acting dean of the College of Agriculture, is David A. Trayham (right), Boston, treasurer of New England Feedmen. The check from the association of feed manufacturers will be used to start a loan fund that poultry, dairy and animal science students may borrow from without an interest charge. George Durgin (left), Fairfield, Maine, secretary of the association, looks on.

Annual Sales Meeting Held by Whitmoyer

MYERSTOWN, PA. — Lectures, panel discussions, films and individual conferences were used to get across recent information on the marketing of veterinary pharmaceutical and nutritional products at the Whitmoyer annual sales meeting at the home offices of Whitmoyer Laboratories, Inc.

Henry C. Suppan, Whitmoyer sales manager, developed and presided over the sales program. In addition to the salesmen of the parent company, Whitmoyer affiliated companies and several major distributors were represented at the meeting. Representatives were present from Whitmoyer Laboratories of Dixie, Inc.; Whitmoyer Laboratories, Ltd. (Canada); Whitmoyer International, Ltd.; Grandone, Inc. (New England distributor); G&M Sales Co. (North Carolina distributor), and a Swiss firm.

Marketing events of the past year and developments in the poultry and animal health field were reviewed and plans for the coming year were outlined by various members of the Whitmoyer staff.

TRY THE COLUMBUS heavy duty industrial ROLLER MILL AT OUR EXPENSE!

Endorsed by grain dealers, the Columbus heavy duty Roller Mill will roll all grains. Superior design, sturdy construction for years of profitable service. Four sizes—300 bushels, 600 bushels, 900 bushels, 1200 bushels per hour, with or without electric motor.

THREE MODELS:

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Operate the mill 10 days. If not satisfied, return it. WE WILL REFUND YOUR MONEY AND PAY RETURN FREIGHT.

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Just these 3 fill every mineral need

Now—from one manufacturer—a complete mineral line. Stock *only these three,* and you take care of every customer's mineral requirements. Profit from fast turnover, proven consumer acceptance, and continuing advertising support.

DARLING'S
MIXING MINERAL CONCENTRATE

For *custom mixing.* Contains *9% phosphorus*—up to *3 times* that of ordinary mixing minerals. This concentrated formula, in 25 lb. bags, saves *one-half* on freight and storage. Easier handling, too. More profit for you—and a better buy for your customers.

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Free-Choice MINERAL MIX

Formulated with one-half special steamed bone meal . . . DARLING's mineral mix contains *6% phosphorus.* It's *all feed,* every ingredient digestible and highly available. DARLING continues to offer its *money-back guarantee* that all livestock will eat it *free choice.*

DARLING'S
Weather-Resistant MINERAL BLOCK

A *complete* mineral block, supplying not only the usual salt and trace minerals, but also the needed *phosphorus* and *calcium.* Contains one-half special steamed bone meal . . . *6% phosphorus.* Guaranteed palatable. Specially treated to prevent deterioration during storage and exposure.

Order all three from your favorite distributor!

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Group Sees Need For More Research On Avian Leukosis

WASHINGTON — Emphasis on study of the avian leukosis complex —a poultry disease condition that results in uncontrolled behavior of blood-forming cells—is urged by the U.S. Department of Agriculture's Poultry Research & Marketing Advisory Committee, which held its annual meeting at Albany, Cal., Jan. 18-21.

Avian leukosis is still the most destructive disease among poultry, causing annual losses estimated at $60 million, committee members pointed out. Understanding and controlling this disease may give clues to an understanding of leukemia, a related form of the condition in man, they said.

Research on the role of fats and fatty acids in human nutrition also needs increased emphasis, the committee said. Some of the questions that such research would seek to answer are: What are the conditions under which the cholesterol level in human blood is raised to a point where it contributes to pathological conditions? How can the differences in reaction of each of the fats and fatty acids in combination with other food constituents be explained? How can the fundamental differences among fats and fatty acids and their nutritional applications be determined?

Important Study

More fundamental knowledge of the composition and physical properties of poultry and eggs is needed in the area of utilization research, the committee said, but also important are studies aimed at developing new and improved poultry and egg products.

In the area of marketing research the committee listed the following high priority research needs: (1) Research on consumer discrimination and preferences aimed at determining the factors affecting consumer purchases of poultry and eggs and (2) development of objective measurements of poultry market quality.

Committee members strongly urged further research aimed at developing chemicals that have a favorable effect on poultry production efficiency. This was suggested as part of an effort by USDA to increase public understanding of the use of agricultural chemicals.

Other farm research needs that the committee indicated merit priority attention include: (1) Breeding studies to obtain birds that are resistant to stress and can produce meat and eggs with improved efficiency and (2) basic and applied studies of poultry diseases now resulting in costly losses to the poultry industry.

Established under the Research and Marketing Act of 1946, the committee is made up of national leaders in the poultry industry. Its detailed recommendations for poultry research to be undertaken by USDA will be submitted formally to the department soon.

Committee Officers, Members

Richard Hanson, Corvallis, Ore., poultry breeder and hatchery operator, was reelected chairman of the group, and W. H. Wiley, director of the Rhode Island Agricultural Experiment Station, Kingston, was renamed vice chairman.

Other committee members are: Richard Forsythe, director, Central Laboratories, Henningsen, Inc., Springfield, Mo.; R. Frank Frazier, executive vice president, National Broiler Council, Richmond, Va.; O. H. Green, poultry producer, Spartanburg, S.C.; Oscar Grossman, manager, Delaware Valley Farmers Cooperative Assn., Frenchtown, N.J.; Gordon W. Sprague, director, economic research, Land O'Lakes Creameries, Minneapolis, Minn.; L. N. Thompson, general manager, Poultry Producers of Central California, San Francisco; C. H. Thurnbeck, turkey producer, Forest Lake, Minn., and Henry Van Roekel, professor of veterinary science, University of Massachusetts.

Productive Acres Sales Manager Is Appointed

OSKALOOSA, IOWA—Productive Acres Manufacturing Co., Oskaloosa, has announced the appointment of Kenneth Russell as midwest sales manager.

Kenneth Russell

Mr. Russell is a 1947 graduate of Iowa State University with a major in agricultural education. From 1948-51 he was employed as a field man with the Keokuk County Farm Bureau. He became a vocational agriculture instructor in 1951, and held that position until his present appointment.

Pamco manufactures hydraulic-driven bulk feed handling equipment.

Heads Staley Publicity

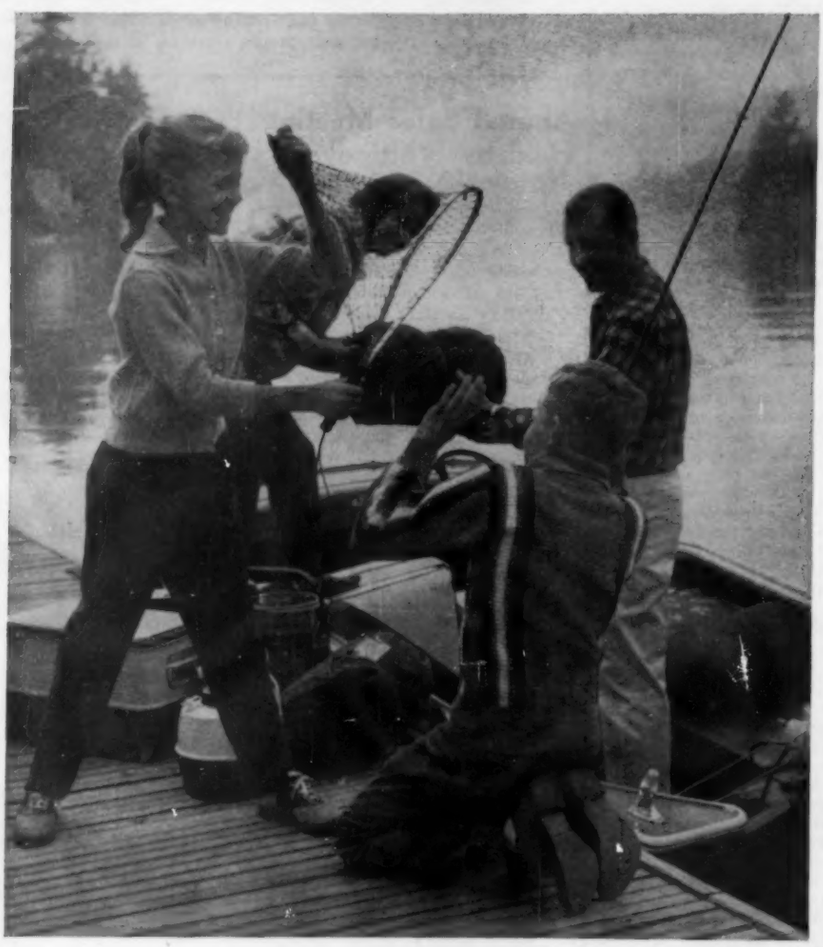
DECATUR, ILL.—Appointment of John N. DeBoice as public relations director of the A. E. Staley Manufacturing Co. was announced by A. E. Staley, Jr., company chairman.

Mr. DeBoice succeeds James H. Beaumont, who was named assistant corn division manager of the Decatur corn, soybean and chemical processing concern.

Mr. DeBoice joined the Staley company in 1957 as editor of the Staley Journal, and has been assistant public relations director for the past two years. He was previously community relations supervisor with Caterpillar Tractor Co. in Decatur and a reporter on the Decatur Review.

NEW DEALERS

FAIRBURY, ILL.—The following dealers have announced they will handle the complete line of Honeggers' & Co., Inc., livestock and poultry feeds, Honegger Layers and farm buildings and equipment: Crowder Feed Mill, Jackson, Tenn.; Christensen Seed & Fertilizer, Audubon, Iowa; Newton Mobile Milling, Lexington, Tenn.; Wurth's Feed Service, Hartsburg, Ill.; Clarence A. Herman & Sons, Tremont, Ill.; Nicholls Implement Co., Pleasant Hill, Mo., and Seno's Feed Service, Burlington, Wis.



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PEOPLE HAVING FUN—you see them everyday—well-dressed, well-equipped, well-adjusted people . . . people who seek new ideas . . . who want and can buy the better things in life. You call them customers.

Businesspaper advertising plays a vital part in making this good life possible. It is a vital link in today's business. Think of the many times it has given you new ideas for product improvement . . . for new methods and production techniques . . . for broadening of markets and product lines. Businesspaper advertising develops new customers for you, helps you increase your profits, helps *your* family enjoy THIS GOOD LIFE which makes America great.

Advertising helps you enjoy the good life

PAY WAY EXTRA RICH FEEDS ARE FAST SELLERS
Pay Way Feed Mills, Inc.
Kansas City, Mo.

George Dowell, Jr. Jesse James

Dawe's Labs Names Territory Managers

CHICAGO — George Dowell, Jr., and Jesse James have been named territory managers by Dawe's Laboratories, Inc.

Mr. Dowell was appointed manager for Alabama, Louisiana and Mississippi. He succeeds Frank Lininger, who was promoted to regional sales manager in the southwestern region. He will report to Ken Simms, southeastern regional sales manager.

Mr. James was named manager for Oklahoma and western Texas to replace Hal Whiteside, who has been named director of technical services for the southern region. He will headquarter in Dallas and report to Mr. Lininger. Mr. James was formerly with Butler Paper Products Co.

Aeration Equipment Lease Plan Reported

CHICAGO — Rolfes aeration and temperature scanning equipment may now be leased for terms from three to five years, it was announced by George A. Rolfes, president of Rolfes Grain Aeration Co. and Rolfes Electronic Corp., Boone, Iowa, and Robert Sheridan, president of Nationwide Leasing Co., Chicago. Nationwide is an equipment leasing firm.

All equipment, plus custom installation, is now available for lease to any organization which stores grain, Mr. Rolfes said.

"One of the most important features of this program is the fact that a customer does not need a large amount of cash to secure the aeration and temperature scanning facilities which protect his large grain investment in either vertical or flat storage," Mr. Rolfes said. "By leasing this equipment, working capital is kept free for other uses."

The new Rolfes leasing program will be conducted through the facilities of Nationwide Leasing Co. and will be available nationally from all Rolfes sales representatives.

Arizona Poultry Unit Selects President

TUCSON, ARIZ.—Jack W. Combs, Queen Creek, will head the Arizona Poultry Federation this year.

Mr. Combs and other officers were elected recently at the federation convention on the University of Arizona campus here. Also elected were William Auerbach, Tucson, vice president, and Dr. Ernest Parker, Tempe, secretary-treasurer.

A "good egg" award, in the form of an engraved plaque, was presented Mel E. Stone, Phoenix, for his "outstanding service to the poultry industry of Arizona as state chairman of the Poultry & Egg National Board."

Beacon Milling Names Area Sales Manager

CAYUGA, N.Y.—Alem B. Smith, Mifflinburg, Pa., has been appointed Pennsylvania area sales manager for Beacon Milling Co., division of Spencer Kellogg & Sons, Inc.

Alem B. Smith

He will be responsible for sales activity and dealer and feeder relationships in Pennsylvania except for 13 north-central and northeastern counties. The area he is responsible for is a part of the firm's York division, headed by F. S. Kennedy, vice president.

Mr. Smith graduated from the Vermont State School of Agriculture, and then managed the dairy plant for a central New York dairy operation. He subsequently entered the feed business where he has had 16 years experience, both at the retail and wholesale levels. Ten of these years have been with Beacon.

Merck Representative

RAHWAY, N.J.—Walter L. Wilson has been named by the chemical division of Merck & Co., Inc., Rahway, as an animal health representative for northern Ohio and eastern Michigan.

He will report to Walter M. Bruso, central region manager for agricultural products in Chicago.

Mr. Wilson majored in business management and marketing at Rutgers University and also has taken specialized courses in sales and marketing. He has been with Merck for many years. His most recent assignment in Rahway was as technical sales and service coordinator for agricultural products.

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(85% FEEDING CANE MOLASSES EQUIVALENT)

Econolass is the economical, dry blackstrap molasses product dehydrated on soybean mill feed. It means added palatability for your feeds and easier mixing. CK's Econolass is packed in moisture-resistant 50 lb. bags. It is never sticky, won't ball up or harden. Order and reorders you'll get with Econolass.

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These calculating individuals have plans to make your new feed mill the most efficient, profit-producing operation possible. They figure that they can deliver maximum production, low operating costs, more profitable results. And . . . unless you're the rare exception . . . they're absolutely right!

They're experts in many fields . . . plant automation, efficiency evaluation, machinery design, financing and contracting. They originate radical new ideas and methods to change "it-can't-be-dones" into "I-wouldn't-have-believed-its".

As part of the Myers-Sherman automation engineering team, their job is to create new and better mills and mill equipment. They're the idea men whose revolutionary new concepts are incorporated in every piece of the famous Fords line we manufacture. Mills of their design which are completely operated electronically by one man are already in use and that's just the beginning.

You can put them to work designing your complete new mill . . . or modernizing your present one . . . at our expense! They'll show you how it should be planned to fit your individual needs . . . explain how we can take the whole job off your hands or tackle any part of it you wish . . . give you the details on the 54 convenient Myers-Sherman purchase plans that let you pay as you earn. We can even lease it to you if you wish!

Mail this coupon for our new booklet on complete mill planning and construction services.

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FARMERS' ELEVATOR SERVICE COMPANY
FORT DODGE, IOWA

This all-concrete FELCO push-button feed mill and warehouse at Fort Dodge, Iowa, is managed by Morel Stiestjes. The mill features individual scales for each ingredient, conveying equipment direct from packers to truck loading dock or warehouse storage. Bulk carload or truck unloading and bulk finished product loading facilities are included. Let us put our experience in design and construction at your disposal.

★ ELEVATORS
★ FEED MILLS
★ SEED PLANTS
★ WAREHOUSES

***Hogenson* Construction Co.**
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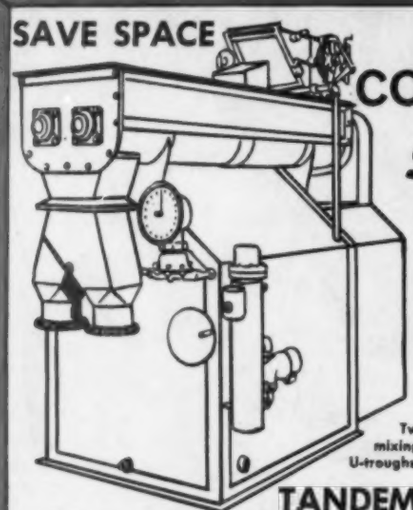

Applies liquids to both light and heavy feeds at slow speeds with tandem mixing principle.

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Arkansas Compares Cage, Floor Flocks For Egg Production

EDITOR'S NOTE: The accompanying article by Eddie B. Smith and James H. White, University of Arkansas economists, is from Arkansas Farm Research, a university publication. Mr. Smith is a graduate student in agricultural economics and Mr. White is an assistant agricultural economist.

Cage flocks and floor flocks are two methods of producing commercial table eggs in Arkansas. Producers are interested in the relative profitability of the two systems. Since each requires a different set of resource inputs and follows different production practices, the investment requirements, costs and returns were developed for each system.

In the fall of 1957, a survey was made of 41 cage producers and 52 floor producers in southwest Arkansas to obtain data on investment requirements for each system. All producers in the survey had flocks exceeding 500 hens. Egg production on these farms was a supplementary enterprise which was cared for with family labor.

The average investment requirement in houses and other buildings, cages and equipment was $3,665 for cage flocks averaging 1,497 hens, compared with $3,459 for floor flocks averaging 1,560 hens. This amounts to an investment, exclusive of the hen, of about $2.45 per hen for cage flocks and $2.22 per hen for floor flocks.

Of the total investment for cage flocks about 56% was for laying houses and other buildings, 37% for cages and 7% for other equipment. Houses and other buildings accounted for 73% of the total investment for floor flocks; 20% was for roosts, nests, feeders, waterers and litter, and 7% was for other equipment.

To determine the relative profitability of the two systems, cost and return information for 1957 and 1958 was obtained from 14 cage producers and 26 floor producers. A summary of the annual costs and returns per 100 hens for each system is shown in the table.

Cage Flocks

Cage flocks were fed a total of 8,533 lb. feed per 100 hens annually and produced 1,572 dozen eggs, an average of 5.4 lb. feed per dozen eggs produced. Total cash costs consisted of feed, $346.54; marketing charges, $23.58, and other costs, $21.26. Thus cash costs for cage flocks amounted to 24.9¢ per dozen eggs produced.

Estimated non-cash costs (including depreciation and interest on the investment in buildings, equipment and hens; flock depreciation, and labor) were $181.97 per 100 hens annually or 31.7% of the total cost. Labor requirements were estimated to be about 20 minutes per 100 hens per day or 123 hours annually. Non-cash and cash costs amounted to $573.35 per 100 hens per year or an average of 36.5¢ per dozen eggs produced.

Total returns from cage flocks were $556.47 per 100 hens per year, of which $550.20 was from the sale of eggs. Cash returns above cash costs were $158.82, and the net return above all costs was minus $16.88.

Floor Flocks

Floor flocks consumed 9,100 lb. feed per 100 hens annually and produced 1,850 dozen eggs for an average of 4.9 lb. feed per dozen eggs. Cash costs were made up of feed, $369.13; marketing costs, $27.75, and other costs, $8.53, for an average of 21.9¢ per dozen eggs produced. Cash costs amounted to 65.3% of total costs.

Non-cash costs consisted of the same items as for cage flocks and amounted to $215.49 per 100 hens per year. Average labor requirements for each 100 hens were estimated to be about 21 minutes per day or about 130 hours annually. The total cost of producing eggs with floor flocks was $620.90 or 33.6¢ per dozen.

Annual returns from floor flocks were $653.77 per 100 hens, of which $647.50 was from the sale of eggs. Cash returns above cash costs amounted to $242.09 and net return above all costs was $32.87.

On the basis of these data cage flocks required a larger initial investment, consumed more feed per dozen eggs produced and produced fewer eggs per 100 hens than did floor flocks. This resulted in a higher cost of production per dozen eggs for cage flocks and in a lower net return.

J. H. HEALEY DIES

NEW YORK—James H. Healey, former vice president in charge of the southern division of Corn Products Co., died recently. He was 78 years old.

Costs and Returns per 100 Hens per Year for Cage and Floor Flocks

Item and unit	Unit price cents	Cage flocks Quantity	Cage flocks Value dollars	Floor flocks Quantity	Floor flocks Value dollars
Cash costs:					
Mash, lb.	.0409*	8,395	343.36	8,661	354.23
Grain, lb.	.0384*	43	1.65	352	13.51
Shell and grit, lb.	.016*	95	—1.53	87	1.39
Marketing cost (cooling and hauling), doz.	.015†	1,572	23.58	1,850	27.75
Other‡	....	....	21.26	....	8.53
Total cash costs	....	....	391.38	....	405.41
Non-cash costs:					
Depreciation					
Building and equipment,	....	Annual	13.82	Annual	17.71
Flock,**	....	Annual	80.23	Annual	106.38
Interest on investment,††	....	Annual	15.66	Annual	15.31
Labor (family), hour	58.7‡‡	123.1	72.26	129.6	76.09
Total non-cash costs	....	....	181.97	....	215.49
Total costs	....	....	573.35	....	620.90
Returns:					
Eggs, doz.	35***	1,572	550.20	1,850	647.50
Manure credit,	....	....	6.27	....	6.27
Total returns	....	....	556.47	....	653.77
Cash returns above cash costs	....	....	158.82	....	242.09
Net return above all costs	....	....	—16.88	....	32.87

*Average prices paid by producers.
†Average marketing cost paid by producers.
‡Includes medicine, pest control, utilities, marketing supplies, repairs on houses and equipment, taxes and miscellaneous expenses.
**(Value of flock at beginning of year plus cost of birds purchased)—(value of birds sold plus value of birds at end of year).
††Charged at rate of 6% annually on average investment in buildings, equipment and hens.
‡‡Average hourly wage rate for Arkansas farm labor in 1957.
***Weighted average price of all eggs reported on the Little Rock market from December, 1957, through July, 1959.

● No. 12 in a series of conversations with Gooch Feed Dealers

"Gooch's complete line helps me sell the year around"

"I tell my customers I can give them a Gooch Feed for every critter on the place—including the farm dog. And they are better customers because once their stock is started on Gooch, they can follow the Gooch feeding program right on through to market. I'll sell a hog man Pig Booster Crunchetts for his baby pigs, say. Then when his pigs are a few weeks older he's back for Pig Grower. Later he buys Hog Supplement. He likes to get on a feeding program and stick with it, since it's the surest way of getting the most out of his livestock. And once he's started on a Gooch program . . . Well, the Gooch Feeds he's using are the best salesmen for more Gooch Feeds."

Complete feeding programs help Gooch dealers do good business during all seasons. And having a proven feeding program for every kind of stock helps them develop more and more business from each customer. Customers appreciate being able to buy all their feed at one place—rather than picking up a bit here, a bit there. And the Gooch programs are designed to make it easy to use Gooch Feeds correctly for the best possible results.

If you'd like to build your feed business on a sound year around basis by offering your customers complete feeding programs, inquire about a Gooch franchise. You're invited to write your nearest Gooch office.

GOOCH FEED MILL COMPANY

Lincoln, Nebraska • Salina, Kansas • Council Bluffs, Iowa
Dalhart, Texas • Vicksburg, Mississippi

GOOCH RED CIRCLES ARE VALUABLE! GOOCH'S BEST COLLECT THEM

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Classified advertisements received by Tuesday each week will be inserted for the issue of the following Saturday. Rates: 20¢ per word; minimum charge $3.00. Situations wanted, 15¢ a word; $2.25 minimum. In figuring cost of your classified ad . . . each word, abbreviation, telephone exchange and number, set of initials, or group of figures counts as a word. To the number of words in your want ad itself add six (6) words for your name and address or name and address of your firm. This applies for both direct-reply ads and for blind ads containing a box number. If an ad is keyed, care of Feedstuffs, 25¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of $13.00 per column inch. No discount on ads ordered for more than one insertion. All Want Ads cash with order.

SITUATIONS WANTED

CHEMICAL ENGINEER—OVER 20 YEARS' experience in all phases of vegetable oil milling laboratory, plant supervision, process and product development. Available immediately. Address Ad No. 5634, Feedstuffs, Minneapolis 40, Minn.

EXPERIENCED SALESMAN DESIRES POSITION in Southeast, prefer north Georgia, Florida or South Carolina. 35, married, family, animal husbandry graduate. Experience: livestock farming, teaching adult vocational agriculture and 5 years' district sales manager regional feed company, promotional and selling poultry dealers, contractors, mills. Now employed but desire change. Guaranteed salary now in upper four figures. Average yearly sales for past four years $280,000 to $540,000. Full details exchanged first letter. Address Ad No. 5644, Feedstuffs, Minneapolis 40, Minn.

HELP WANTED

MIDWESTERN DOG FOOD MANUFACTURER requires salesmen for state of Indiana. Liberal salary, commissions and expenses. Car necessary. Write complete resume to: G & W Pet Foods, Box 673, Danville, Ill.

FEED ENGINEER WANTED FOR MANAGERIAL job with feed ingredient and feed manufacturing company. Excellent starting salary plus bonuses. Address ad No. 5625, Feedstuffs, Minneapolis 40, Minn.

WANTED: EXPERIENCED TRADER TO establish general grain merchandising division. Central territory interior location experience preferred. Salary compatible with experience. The Mennel Milling Co., P.O. Box 189, Fostoria, Ohio.

WANTED — MANUFACTURER'S REPRESENTATIVE, Texas, exclusive contract to take responsibility of sales of established line of feed processing equipment. Complete line includes mills, mixers, conveyors, hoists, molasses mixers, package plants, etc. Excellent potential for experienced individual or firm calling on custom and large feed processing plants. Prater Pulverizer Co., 1515 South 55th Court, Chicago 50, Ill.

SALES ENGINEERS: PRESENTLY SELLing, or familiar with, feed milling machinery, pellet mills, coolers, liquid blending equipment, feed mill layouts. Feed production manager acceptable. Travel Monday through Friday. Sober and reliable. Age—30 to 40. Engineering background, heavy emphasis on sales. Interested in high earnings—$15,000 per year or better. Territories available in Nebraska, Illinois, Indiana, Missouri, and Oklahoma. Reply only if you possess above qualifications and are presently successful. Address ad No. 5607, Feedstuffs, Minneapolis 40, Minn.

NUTRITIONIST

Good number 2 man under Products Director for feed formulation and quality-control responsibilities. Graduate degree in nutrition required—Ph.D. desirable.

Write
DIXIE MILLS COMPANY
P. O. Box 351
East St. Louis, Illinois

SUPERINTENDENT WANTED

Large grain company has an opening for man between the ages of 35-45. Must be thoroughly experienced in all phases of grain elevator operations. Part time travel. College background essential. Please furnish complete data—personal information, education, experience, references and salary expected. Address ad No. 5614, Feedstuffs, Minneapolis 40, Minn.

Director of Foreign Sales

Speak Spanish; age 30-45; working knowlege of animal and poultry feeding; some knowledge of feed mixing equipment and handling of export shipments helpful.

Send resume to
John W. Eshelman & Sons
Lancaster, Pa.

HELP WANTED

EXPERIENCED GRAIN AND FEED MAchinery salesman needed by distributor and manufacturer, to cover exclusive established territory in Michigan. Draw and commission. Send photo, experience and references in first letter. Address Ad No. 5587, Feedstuffs, Minneapolis 40, Minn.

MACHINERY FOR SALE

FOR SALE — 1957 INT. COMBINATION bulk truck, 7-ton capacity, Dodgen box. Ed Ringger, Gridley, Ill.; Phone 2 Green.

12½ - TON TOLEDO DIAL SUSPENSION hopper scale, like new, 32 inch dial, Model 2500. O. W. Meyer, Napoleon, Ohio.

FOR SALE—1 USED HEIL DEHYDRATOR SD-5x25 complete with furnace, motors, cyclones, stem crusher. Address ad No. 5621, Feedstuffs, Minneapolis 40, Minn.

PAKMASTER BAG-BULK BODY 16 FT. Write or phone for a bargain price. Steinbach Flour Mills, Ltd., Davis 6-3428, Steinbach, Manitoba, Canada.

WHIRLAWAY AIRBLAST CAR LOADERS, cast iron pulleys, new and used feed and elevator equipment. Hagan Mill Machinery, P.O. Box 574, Jefferson City, Mo.

NEWLY RECONDITIONED 100 H.P. G.M.C diesel power unit with power takeoff. Phone Oxford 774. John E. Stively, 251 South Third St., Oxford, Pa.

FEED MIXER, 1-TON CAPACITY, guaranteed first-class throughout, 5 H.P. motor drive. Address Ad No. 5479, Feedstuffs, Minneapolis 40, Minn.

CHAMPION MOBILE GRINDER AND mixer units. Champion Portable Mill Co., 2105 Como Ave. S.E., Minneapolis 14, Minn.

1959 B & L PORTABLE MILL—6 MONTHS old, 10,000 miles, complete, in new condition. $15,000—delivered with instructions. Eastern Agri-Business Corp., 732 First St., S.E., Roanoke, Va.; Phone DI 4-5859.

FOR SALE—W5 JAY BEE HAMMERMILL with direct connected 150 h.p. motor. Also used 10'x36' McGhee dehydrator complete. Napoleon Alfalfa Mills, Inc., Napoleon, Ohio.

CLARK MICHIGAN 12 B ENDLOADER, three elevator legs complete, Tyler-Hummer screen, Rotex screens, electric equipment, ABC oil burner, etc. Write for details. Regal Packer By-Products Co., Lynn Center, Ill.

FOR SALE—WORTHINGTON 6 CYLINDER diesel engine, 4 cycle direct connected to Westinghouse 150 KVA generator, serial No. 1S17P109. Complete with all controls and panel board. 220 or 440 volts. Napoleon Alfalfa Mills, Inc., Napoleon, Ohio.

DAFFIN FEEDMOBILE — GOOD CONDItion after major overhaul. Bargain price $6,950 for fleet owner needing more service facilities in peak season. Address Ad No. 5640, Feedstuffs, Minneapolis 40, Minn.

1957 DAFFIN MOBILE MILL, 34,000 miles, Chevrolet truck, low diesel time, excellent mechanical condition, $2,750 down, $9,000 financing available, located in Minnesota. Address Ad No. 5631, Feedstuffs, Minneapolis 40, Minn.

FOR SALE—ENCLOSED MOTORS; RICHardson scale; truck scales; hammermills; oat crimpers; horizontal and upright feed mixers; sewing machines; elevator legs; screw conveyors; molasses mixers and pellet mills. J. E. Hagan Mill Machinery, Box 574, Jefferson City, Mo.

1954 DAFFIN FEEDMOBILE MOUNTED on 1954 Chevrolet truck in good condition. Good selection of used portable mills with mixers and molasses equipment also straight grinders. We have used stationary equipment for sale, too. See Moores Mfg. Co. at Windom, Minn., for all of your mobile and stationary mill requirements. Phone TEmple 1-3223.

100 H.P. ACE SPROUT-WALDRON PELlet mill, complete with motor, coolers, pneu-vac air system; 60 H.P. Sprout-Waldron pellet mill and cooler; 50 H.P. heavy duty California pellet mill; 5-ton S. Howes Eureka horizontal mixer, with silent chain drive and 40 H.P. motor. Call or write J. E. Hagan Mill Machinery, P. O. Box 574, Jefferson City, Mo.; Phone 6-2197.

FOR SALE
Feed and Grain Handling and Processing Equipment
NEW & USED
Scales, Hammermills, Feed Mixers, Sewing Machines, Elevators, Pellet Mills, and Grain Cleaners
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Baltimore 24, Md.

MACHINERY FOR SALE

FOR SALE—1957 CHEVROLET TANDEM 10,700 series, V-8 high speed transmission, 2-way brownie, 20 ft. Pakmaster bulk food box. Truck has new paint. Rhone Raymond Bollman, 147J16, Monona, Iowa.

USED INCUBATORS - BATTERY BROODers. Buckeye streamliner and No. 24 Setters with separate hatchers. Various sizes and makes of battery brooders. Suitable for experimental and test work. Amstuts Hatcheries, Orrville, Ohio.

FOR SALE—60 SINGLE BURNER FLUEless type brooder stoves, 1,000 chick capacity. In good condition. Only one year old. Also Rowe vending machine, 1957 model, 100 dozen capacity. Somerville Poultry Farms Co., Box 309, Somerville, N. J.

SALE—SPROUT-WALDRON 335 CU. FT. horizontal ribbon mixer. Type 304 stainless steel dry material handling installation, including: 1,500 cu. ft. weigh hoppers, bucket elevators, shake and screw conveyors, etc. Perry, 1403 N. 6th St., Philadelphia 22, Pa.

FOR SALE — COMPLETE JAY BEE 26", 5-W hammermill with switches and ammeter, including 200 h.p. Crocker-Wheeler explosion and dust proof motor, 3 phase, 440 volt, 3,600 RPM. Complete "Verti Cool" alfalfa meal cooler, less refrigerating system. Dismantled. Illinois automatic stocker, dismantled, Type LF, 6'x10'8". Schoeneck Farms, Inc., Nazareth, Pa.

MACHINERY WANTED

ALL KINDS OF GOOD USED GRAIN processing machinery. E. H. Beer & Co., Inc., Baltimore 24, Md.

WANTED—ONE (3-TON) NO. 548 HOWES Eureka mixer, without motor. O. W. Meyer, Napoleon, Ohio.

WANTED—ARID AIRE MODEL C DRYER. Write Box 306, Troy, Ohio; Phone Federal 9-6911.

WANTED TO BUY — RICHARDSON scales, bag closing machines and other good mill, feed and elevator equipment. J. E. Hagan Mill Machinery, Jefferson City, Mo.

BUSINESS OPPORTUNITIES

FOR SALE—FEEDMILL—CENTRAL WISconsin. Water power operated. Turbine generates up to 90 H.P. Grain storage capacity 8,000 bu. plus. Complete basic custom milling equipment. Reason for selling—retiring. Address Ad No. 5639, Feedstuffs, Minneapolis 40, Minn.

FOR SALE BY OWNER: GRAIN, FEED, seed and hardware business. Located at Butler, Missouri in Bates County on the main line of Missouri Pacific from Kansas City to Memphis and St. Louis to Wichita. Highway 71 and Highway 52. Buildings consist of 25,000 bushel elevator, air conditioned office and display room, 4 large warehouses and cooling room for eggs and perishable articles. 100,000 lb. Fairbanks-Morse scales with printo-meter, also large hopper scales in elevator. Corn sheller, corn cleaner, Clipper seed cleaner, Carter disk cleaner, roller mill, crimper and mixer. Owing to the fact that this is located on deeded land which consists of 3 blocks and 10 lots of land and the property is all clear of debt it could be financed to a good advantage. Kenney Brothers Grain Company, P.O. Box 26, Butler, Missouri.

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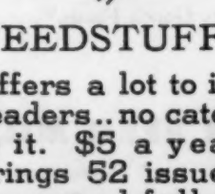

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Hay Pellets for Steers Of More Value Than Long Hay, Test Shows

ITHACA, N.Y.—Will hay in pellet form have a higher value for beef steers than an equal amount of long hay?

Research directed by Prof. John Miller, New York State College of Agriculture at Cornell University, shows it will. Prof. Miller found that 3 lb. of hay pellets added to typical winter rations for growing calves gave about 50% more value than would be expected from long baled hay of the same quality.

The project, which lasted three years, included three experiments in which groups of cattle were fed hay pellets and their weight gains compared with those of animals fed regular baled hay or grass silage.

Other Research

In other research, the Cornell men compared pellets consisting of half corn and half alfalfa meal with ground corn for steers fattened in the barn. The results indicate that the pellets are worth about as much for beef cattle as the straight corn.

Hay pellets were also fed to yearling steers fattened on pasture. It was found that pellets made from alfalfa and orchard grass could replace half to two thirds of the ground corn without reducing gains appreciably. However, the steers which were fed hay pellets ate more and fattened less than the steers fed ground corn alone. Consequently, says Prof. Miller, the hay pellets were actually worth about 75% as much as the ground corn.

Wider Use Seen

Prof. Miller says another advantage of pellets over long hay is ease of handling and storage. He foresees a time when new equipment and research developments will bring hay pellets into much wider use among farmers.

Research at other centers indicates that identical results would not be obtained in the case of dairy cows. The Cornell researchers say their work was done solely with beef cattle, and they have no indication that dairy farmers could expect the same effects.

Dannen Mills Names Advertising Assistant

ST. JOSEPH, MO.—Ralph Melon, farm director for Station KLIK, Jefferson City, Mo., has been named assistant advertising manager for Dannen Mills, Inc., St. Joseph.

Ralph Melon

The appointment was announced by Dwight L. Dannen, president of the feed milling and manufacturing firm.

Mr. Melon, who holds a degree in agricultural education from the University of Kansas, taught vocational agriculture for six years. He also has been awarded an honorary state farmer degree by the Future Farmers of America for his service to the organization in Missouri.

NEW CHEMICAL BRANCH

SAGINAW, MICH.—A new chemical sales branch and warehouse has been established at Saginaw by the chemical department, McKesson & Robbins, Inc., according to an announcement by F. Dean Hildebrandt, executive vice president. The Saginaw branch office is located in the Bearinger Building. Harold McAdow, formerly manager of McKesson's chemical branch at Cincinnati, has been appointed branch manager for this new unit.

Predicts New Credit, Financing Concept In Poultry Industry

TRENTON, N.J.—"The emergence of a whole new concept of credit and financing" in the poultry industry this year is expected by Richard I. Ammon, executive secretary, Northeastern Poultry Producers Council. "Tight credit is forcing a shift in those who take the risk on investment capital," he says in the January issue of NEPPCO News. "Watch for a trend toward spreading and equalizing the risk over all who share in the profits.

"The shakedown of the poultry industry has passed midpoint. We're on the road back, and 1960 will furnish the first real clues of the shape of things to come."

Listed by Mr. Ammon as another of these "clues" were the results of an end-of-the-year survey conducted by Feedstuffs among feed manufacturers of many sizes and categories in all regions of the U.S.

"One result worth pondering were the replies to the question: 'Are you involved in or expect to become directly involved in end product marketing?'" Mr. Ammon remarked. "Some 30% said, 'Yes.' Just five years ago you'd have been lucky to get 1% affirmative replies. How do you think the same question will be answered five years hence? Consider the reply of one eastern feed manufacturer: 'We have been and expect to expand this activity in self defense.' Said another: 'We are investigating.'"

Brand Merchandising

Another clue to the long-range future of the poultry industry, according to Mr. Ammon, will be revealed during 1960 by the extent of brand name merchandising of poultry products. "Will 1960 signal the start of a new era of pre-cooked, 'prepared' chicken and 'branded' eggs?" he asks. "I think so, but what's even more significant, brand name merchandising will stimulate producer organizations to inaugurate direct-to-consumer advertising and promotions of the type, if not to the extent, of the toothpaste, beer and cigarette boys—which, in turn, will create demand in the supermarkets and put the producer back in the driver's seat about as neatly as the Hertz commercials on TV."

Further commenting on "a whole new concept of credit and financing," Mr. Ammon says, "Our entire economy is presently going through a period of tight credit which the experts predict will continue and may even increase in 1960. In our industry, the Chemell case put the brakes on credit about as abruptly as a high school kid on her first driver-training lesson."

"In the past, the producer has frequently been sandwiched between those who own the capital and those who court the consumer. And make no bones about it, the consumer is 'queen.' All our profits—the hatcheryman's, the producer's, the feedman's, the supplier's, the processor's and the retailer's—come from the purse of Mrs. Consumer.

"For a long time, the feedman thought his profits came from feed, and the hatcheryman thought his came from chicks, and even the producer—far removed from the market place—thought his profits came from his co-op or processor. But the retailer knew all along who buttered his bread and took justifiable advantage of it.

"Look for Queen Consumer to show up at the ball with some new suitors," Mr. Ammon writes, "the feed manufacturer, who is becoming interested in end product marketing; ditto, the producer, and the retailer, of course, who always has been.

"Perhaps one will win her favor and rule the roost, but I rather suspect an economic coalition will emerge."

NEW DIRECTORS—The National Broiler Council's board of directors has asked that a broiler promotion program aimed at regaining demand be put into action by March 1 (Feedstuffs, Jan. 30).

Directors shown (left to right) are: Standing—Charles Miller, Piedmont, Ala.; Glenn Fisher, Lafayette, Ind.; R. J. C. Tricou, Jr., New Orleans, La.; Alfred Lambrecht, Wilton, Wis.; H. F. McCarty, Jr., Magee, Miss.; Henry Saglio, Glastonbury, Conn.; Dennis Ramsey, Rose Hill, N.C.; Frank Perdue, Salisbury, Md.; E. S. Kendrick, North Wilkesboro, N.C.; Willard Strain, Dalton, Ga.; J. M. Tankersley, Gainesville, Ga.; H. C. Kennett, Durham, N.C.; Don Corbett, Waterville, Maine; Joe Frank Sanderson, Laurel, Miss.; Ralph Cleveland, Gainesville, Ga.; Raymond Higgins, Hot Springs, Ark.; Willard Adcox, Dalton, Ga., and Frank Frazier, Richmond, Va. Seated—Ed Covell, Easton, Md.; Joe Fechtel, Dallas, Texas; Fred Gaddis, Forest, Miss.; Franklin Hurst, Dayton, Va.; Kirk Hale, Decatur, Ark., and Shannon Skelley, Albertville, Ala.

Harley Bag Names Midwest Salesman

SPARTANBURG, S.C. — Cliff F. Guernsey has been appointed Midwest sales representative of Harley Bag Co., Spartanburg, S.C.

C. F. Guernsey

Mr. Guernsey will headquarter at Louisville, Ky., and will service customers in Indiana, Kentucky and Illinois.

Harley Bag Co. manufactures multiwall paper bags, small paper flour bags and meal bags. Mr. Guernsey is well known in the feed and fertilizer trades, having previously represented the Walker Bag Co., Louisville, for eight years.

California Firm Bought

SAN FRANCISCO—Berger & Plate Co., Inc., San Francisco, has purchased the facilities of Magic Valley Bean Co., Kimberly, Idaho, processor and shipper of dried beans, dried peas, seeds and grains.

The new company will be operated under the name of Magic Valley Bean Co., Inc., with all key personnel being retained and Cleo Barth continuing as general manager.

This acquisition gives Berger & Plate processing facilities both in Idaho and California, the latter being the Northern California Co., Modesto, a wholly owned subsidiary.

Bemis Bag Sales, Net Income Up From '58

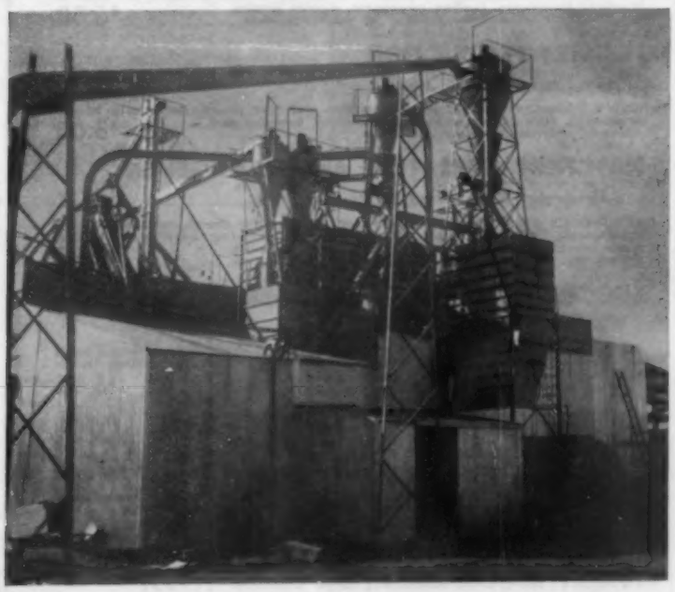
ST. LOUIS, MO. — Sales of the Bemis Bro. Bag Co. for 1959 were up 8% and net income up 16% over 1958, F. G. Bemis, president, announced in a preliminary report to stockholders.

Sales were $131,251,156 as compared with $121,246,401 the previous year. Net income rose from $2,601,130 in 1958 to $3,023,354 in 1959.

After preferred dividends, earnings per share of the company's common stock were $4.24 as compared with $3.67 in 1958.

Mr. Bemis also announced that the board of directors has declared a quarterly cash dividend of 50¢ per share on the company's common stock, payable March 1, 1960, to stockholders of record February 15, 1960. During 1959, the company paid quarterly dividends of 40¢ per share during the first half of the year and 50¢ during the final two quarters.

In his letter to stockholders, Mr. Bemis said, "We are pleased with this year's results. If the economic climate remains favorable, increasing manufacturing efficiencies should result in improved earnings in the future."



MILL EXTERIOR—This is the exterior of the new $175,000 Endeman Feed & Pellet Mill in Williams, Cal.

$175,000 California Feed Mill Operating

WILLIAMS, CAL.—Endeman Feed & Pellet Mill, Inc., is now operating its new $175,000 mill.

The new operation, which will handle 80 tons of pellets per day at peak production on a 24-hour a day basis, is owned by Clyde Endeman, who began with a one-man business eight years ago.

The mill will process ground feed and pellets for hogs, cattle and sheep under its registered Diamond E brand. In addition to the wholesale and retail business connected with its own brand, Endeman's will mix feeds to the customer's specifications as well as grind and roll feed.

Mr. Endeman, president and general manager, explained that the $175,000 cost included a huge hay barn with a storage capacity of 1,500 tons of baled alfalfa.

In the mill, which is of steel construction, a conveyor system running through the center of the barn brings the hay to the chopping mill. It is then blown to the pellet mill.

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Feedstuffs

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OPPOSITION

(Continued from page 4)

strictions of the cancer clause," Dr. Carney cited the case of diethylstilbestrol. "This synthetic chemical has been widely used in human medicine for 20 years and is fed to approximately 75% of cattle in feed lots to improve weight gains," he said.

He pointed out that before the Delaney Amendment, stilbestrol was cleared by FDA on six occasions for six different uses after this agency examined volumes of scientific information submitted. Dr. Carney stated, "Even when the most sensitive analytical tests are applied, no residues of stilbestrol can be found in the meat produced. Yet," he said, "because stilbestrol can be made to cause cancer under unusual laboratory conditions in a few species of animals, additional uses in agriculture are now prohibited by the Delaney Amendment. The chemical can be used now only because clearances were granted before the amendment's enactment."

To demonstrate the value of stilbestrol to the nation's economy, Dr. Carney calculated, "Without this chemical farmers would have had to produce 360,000 more beef cattle in 1959 to provide the same amount of meat produced with this additive. This would be enough beef to feed 2½ million persons for a year."

Comments on Ban

Paul Gerdon, general counsel, Abbott Laboratories, Chicago, said, "Under the provisions of the Delaney Amendment in the food additives provision of the law, FDA had invoked a ban on the use of organic arsenical compounds in livestock feed, although there is no evidence that any organic arsenical compound ever produced cancer either in man or test animals."

Responsible FDA officials told Feedstuffs that the organic arsenicals were not involved in the cancer danger, but, under the rigid policy statement of FDA last year, the organics now have been "caught in a squeeze" and, thus far, FDA has failed to act to relieve them.

MONTANA

(Continued from page 1)

cident Elevator, Sidney, was elected secretary-treasurer to succeed Harry Johnson, Montana Flour Mills Co., Great Falls.

Named directors were Leo Becker, Teslow, Inc., Bozeman, and Ted Westin, Milk River Elevator Co., Chinook.

In other action at the meeting, the association:

—Voted to appoint a committee to study the possibility of working with college, banking, packing and other groups in exploring ways to encourage greater swine production in the state.

—Decided to have a committee named to study the possibility of the association providing a scholarship at Montana State or sponsoring a trip for a graduate student to a scientific meeting.

—Voted to have a committee appointed to study needed revisions in the state feed law and to keep on top of state legislative developments affecting agriculture and the feed industry.

—Voted to have a committee named to look into the possibility of the Montana association becoming affiliated with the American Feed Manufacturers Assn. rather than the Grain & Feed Dealers National Assn. This move had been recommended by the executive committee.

—Voted to have the association continue providing Feedstuffs subscriptions for county agents and extension personnel in order to help keep them informed on developments in nutrition and the feed industry. Also, a committee is to be named to check with county agents and determine how many make use of the publication's information.

Dr. O. O. Thomas, Montana State, told the association of some of the work which a feed industry advisory group might do in its program of cooperation with the college. Dr. Thomas spoke specifically about the development of specifications for use by state institutions in purchasing feed.

Dr. William Burkitt, Montana Flour Mills Co., explained briefly the function of the advisory group. The committee meets with college personnel in order to have a better idea of research work which is being conducted and to make suggestions on research needs.

(A report on the nutrition conference will appear in a subsequent issue of Feedstuffs.)

MIDWEST

(Continued from page 1)

Larry Alley, Pay Way Feed Mills, Kansas City, was named vice president. Charles Harris, Burrus Feed Mills, Fort Worth, was named treasurer, and Harold Fouts, G. E. Conkey Co., Nebraska City, Neb., was elected secretary.

Discussions the second day of the convention highlighted the close working relationships the Midwest association has with colleges in the area and put the spotlight on personnel problems and the money situation.

Lively Skit

Also, feed men were treated to a lively skit entitled, "Back in a Flash with the Cash—We Hope," which poked liberal fun at the practices of feed manufacturers trying to outdo each other in cutting prices and giving services away. The lesson: A talk with a competitor to check out reports on "what the other guy is doing" can often save a feed man much grief.

Another highlight of the convention was the announcement that the Midwest would cooperate with area colleges and universities in helping to observe the 100th anniversary of the land grant college system with a "super" nutrition conference to be held in Kansas City in the fall of 1961.

Here are summaries of talks presented Feb. 8 (summaries of other discussions and events will be reported in subsequent issues of Feedstuffs):

SIZZLING SIXTIES?—The question mark in the title of his talk was emphasized by Maurice Johnson, retiring president of the MFMA and executive vice president of the Professional Feeds Division of Spencer Kellogg & Sons, Inc., Kansas City. "Does the description, 'sizzling sixties' so often referred to mean that we'll be so good we'll sizzle or that some of us are going to fry?" he asked.

Mr. Johnson observed that in the coming decade feed manufacturers must produce in a modern way and in a way best suited to individual businesses. "There are many ways to make money, but if we try to be all things to all people, we will fail. We must make our decision well and follow it well."

The very real concern of midwestern feed manufacturers over the decline in egg production operations in the area was discussed by Mr. Johnson. Hatchery bookings in the area are 35 to 75% below a year ago, he said. At one time, 90% of all the farms in Kansas and Missouri had poultry. Now, less than 50% do.

"I wish I could say that all the farmers are going to be back in the chicken business," he said. "If this business doesn't come back to the area, we have some other things to think about. Farmers may have made a decision to stay out of poultry in the area."

Mr. Johnson also raised these questions: Where are we going to produce eggs? Where is the money coming from? Are bankers pleased? Will feed company managements want to spend heavily for poultry programs? Is it going to be easy to have a resurgence of poultry and dairying in the area?

Looking to the future, Mr. Johnson predicted that many different types of feed mills will survive. However, he commented that "we won't be making a specialized product in one spot and 75 different kinds of other feed, too." And, he asked, "Are you going to cling to concepts that were applied in 1946? Or rely on sales methods that were used two years ago? Are your field service and staff technical people adequate?"

Midwestern feed men might learn something from experiences of their counterparts in England and in California, Mr. Johnson indicated. In England, manufacturers concentrate on manufacturing — in producing their product as cheaply as possible to try to discourage others from competing. In one highly-concentrated poultry area in California, some 50% of the houses which would be considered efficient units in other parts of the U.S. are empty and mills are running at 40 to 50% of capacity. Eggs are being produced in the same area in huge units where they can be turned out profitably for 29¢ doz.

INSPECTION TIME—Some clarification of the Food and Drug Administration's actions in publishing so-called "white lists" of substances "generally recognized as safe" was provided by Ralph F. Kneeland, Jr., assistant to the director of the FDA's Bureau of Enforcement. Mr. Kneeland also described stepped-up inspection activities of FDA "to determine whether you are observing the restrictions placed upon you."

Mr. Kneeland said that one of the greatest misunderstandings about the food additives amendment results from misinterpretation of the significance and meaning of the "white lists" which have been published.

"First let me explain that there is no provision in the food additives amendment requiring or specifically authorizing the issuance of such lists," he said. "In an effort to be helpful we have attempted to list substances used in foods or feeds which we believe are exempt from the law because of a general recognition of safety.

"Obviously, it would be a monumental, if not an impossible, administrative task to list all of the food and feed ingredients that are exempt from the food additives amendment. It has therefore been necessary, in developing these white lists with the limited amount of time that we are able to devote to this phase of the matter, to follow some guidelines as to what substances shall be included. Two of these are:

"(1) Is the substance one that merits consideration because it has established usefulness?

"(2) Is it one that is used extensively?

"Taking these two criteria as a starting point we have reviewed the available scientific facts concerning the toxicity of an ingredient. We then have evaluated the usefulness of the substance in terms of its functional or, as in the case of nutrients, the nutritional needs of man or other animals.

"Where an evaluation of such facts leads us to the conclusion that an ingredient will serve a useful purpose at a given level in the daily ration and this level is in our judgment one that would be generally recognized as safe we have proposed in a Federal Register announcement that such ingredients at the indicated levels and for the indicated purposes be considered as generally recognized as safe and invite comment on this view from the scientific world.

"The Federal Register announcement is not a proposed regulation under the law. It is not an exclusive listing of substances within a given category that are generally recognized as safe. The list either in its proposed form or in a final form does not rule out other uses or other levels of use of the substances listed or other substances on the grounds that such other substances, uses or levels would not be generally recognized as safe.

"Where in the proposed lists we have placed what have been dubbed 'limits' upon levels of usage in the case of feed ingredients such as trace minerals, the levels refer to the amount of the trace mineral that may, in our judgment, be added to the daily ration without involving a hazard. It does not take into account the amount of the trace mineral that may be present as a natural part of the normal feed ingredients that make up the total ration of the animal. The levels likewise are stated in terms of percentage of the total feed intake and not upon the percentage that may be present in a particular feed or premix."

No Firm Conclusions

Mr. Kneeland said that FDA has reached no firm conclusions with respect to other trace minerals, other uses for the listed substances either at different levels or for other animals. He said FDA wishes to have comments on the proposed lists and industry cooperation in developing more lists of substances that can be cleared from consideration under the food additive procedure.

"It is a little disconcerting to hear

(Turn to MIDWEST, page 122)

TOP OF THE HOPPER

(Continued from page 2)

ment. Do you think this is unreasonable? The trouble with the people who give us destructive criticism is they do not stop to consider the investment and liability we have. The only income I have not mentioned here is the unloading and loading out. The reason it is left out is most warehousemen just about break even on this, some do not."

We have not heard whether Mr. Pearson replied, or whether he quoted the letter in his column as Mr. Allen suggested, but he nevertheless was at least exposed to some solid documentation from the industry side of the fence.

OBSERVANCE OF ADVERTISING WEEK this year starts on Feb. 14, which makes it particularly appropriate to express some thoughts of admiration—or even affection—on the subject. (If you forgot, and you already know it and are sorry, Feb. 14 is Valentine's Day.) "Advertising helps you enjoy the good life," is the theme of the week this year.

Publishers of businesspapers frequently hear the comment from readers that they learn as much from reading ads as they do from the editorial columns. There is truth in this, because advertising in businesspapers helps provide the vital service of suggesting ways to improve products and broaden markets. When a businessman is doing these things, he is most likely to achieve the "good life" for himself, his family and associates. Beyond that, he is keeping the wheels of the economy turning and benefiting those whose needs his business serves. Advertising is a vital part of progress, and it will produce even greater "good life" results in the years ahead.

The FEED MARKET

PRICE QUOTATIONS, MARKET TRENDS
OF PRINCIPAL INGREDIENTS

NOTE: Quotations on feed ingredients shown in these and adjoining columns are wholesale prices, per ton, bulk, for prompt delivery, unless otherwise noted. They are the latest quotations available from Feedstuffs correspondents and are not necessarily those in effect on date of publication. The prices represent fair average trading values and do not necessarily represent extreme low or high levels at which individual sales might have occurred. A descriptive summary of supply and demand factors prevalent in the feed market appears on page 2.

A AND D FEEDING OIL

Boston: Demand slow; supply ample; 400 D, 2,000 A 21½¢ lb.; 300 D, 3,000 A 21¢; 300 D, 2,250 A 19½¢; 300 D, 1,500 A 18¢; 300 D, 750 A 16¢; 75 D, 750 A 15½¢.

Denver: Demand fair; trend steady; supply ample; 23¢ lb., f.o.b. Denver, 2250 A, 300 D.

New York: Demand fair; trend steady; supply ample; 1,500 A, 300 D 16¢ lb.; 2,250 A, 300 D 17½¢ lb.

Minneapolis: Demand fair; supply ample; 10,000 A 22¢ lb.; 300 D, 2,250 A 16¾¢ lb.; 300 D, 1,500 A 15½¢ lb.; 300 D, 750 A 14¢ lb.

Chicago: Demand fair; trend steady; supply ample; straight A feeding oil, with 10,000 units vitamin A per gram, 7@7¼¢ s. million units of vitamin A, t.c.l., packed in 55-gal. drums, f.o.b. Chicago, drums included.

ALFALFA MEAL

Omaha: Demand and trend steady; supply ample; 17% dehydrated, 100,000 A units, bulk pellets $52; sacked meal $57, Omaha basis.

Kansas City: Demand slow; trend steady; supply adequate; 17% dehydrated alfalfa, guaranteed 100,000 A on arrival, reground pellets $55 bulk, pellets $53@54 bulk; 18% dehydrated alfalfa, guaranteed 125,000 A on arrival, reground pellets $56@59 bulk; 20% dehydrated alfalfa, guaranteed 150,000 A on arrival, reground pellets $65; suncured alfalfa demand slow, ample supplies, 13% pellets $35@35.50 bulk, No. 1 ¼-in. $38.50@39, No. 2 ¼-in. $36.50, sacked.

Los Angeles: Demand slow; trend weaker; increased production; dehydrated meal, 17% protein, 100,000 A $56@57; dehydrated pellet meal, 17% protein, 100,000 A $58@59; suncured meal, 15% protein $51@52; suncured crumbles, 15% protein $53@54.

Ft. Worth: Demand fair; supply sufficient; sacked: dehydrated, 17%, 100,000 A $66.50@67.50 rail, $66 truck; suncured 13% ¼-in. grind No. 1 $46 truck; 15% fine grind, dry $43, with 2% fat added $50, rail or truck.

Boston: Demand and supply fair; dehydrated, 17% $69; suncured, 13% $48.

Philadelphia: Demand and supply fair; 17% dehydrated $68.50.

Portland: Demand slow; trend lower; supply ample; suncured, 15% $49; dehydrated $68.40.

Denver: Demand fair; trend steady; supply ample; dehydrated $52, sacked meal; $50, bulk pellets.

Cincinnati: Demand fair; trend steady; supply adequate; 17% dehydrated, 100,000 vitamin A $62.50@65.

St. Louis: Demand slow; trend steady; supply ample; suncured, 13% fine, sacked $44; dehydrated, 17%, 100,000 A pellets, demand slow, trend steady, supply ample, bulk $57.

Memphis: Demand fair; trend steady to lower; supply ample; dehydrated, 17% protein, guaranteed 100,000 units vitamin A $62.50.

New Orleans: Demand fair; trend steady; supply adequate; 17% protein, 100,000 vitamin A, bulk $67@68, sacked $72@73.

Seattle: Demand fair; trend firm; supply good; 15% protein suncured $50, delivered, truck loads, sacked; 136,000 A unit dehydrated $72, delivered, truck loads, sacked.

Chicago: Demand fair; trend higher on 17%; supply moderate; 17% dehydrated, 100,000 units vitamin A $58.50@60; 13% suncured $40.50@41.50.

Minneapolis: Demand still slow; price steady; 17% dehydrated, 100,000 units vitamin A reground pellets $58@59; oiled reground pellets $60@61; sacked $4 more.

St. Paul: Demand good; supply ample; bleachable fancy tallow off ½¢ to 5¼¢ lb., f.o.b. producer's plant.

ANIMAL FATS (STABILIZED)

Ogden: Supply ample; $5.50 cwt.

Louisville: Demand better; trend stronger; supply good; in tanks, liquid form; bleachable white 5¾¢ lb.; white tallow 6¢ lb.; yellow grease 5¾¢ lb.

Kansas City: Demand fair; trend steady; supply ample; prime tallow 5@5¼¢ lb.

Ft. Worth: Demand good; supply moderate; prime tallow, tank cars 5¾¢ lb.; drums 5¼¢ lb., f.o.b. north Texas packing plants with returnable drums.

San Francisco: Demand fair; supply ample; bleachable fancy 6¢ lb.; yellow grease 4¾¢ lb.

Boston: Demand steady; supply ample; stabilized tallow 5¾¢ lb.; yellow grease 5¢ lb.

Chicago: Demand good; trend firm; supply ample; bleachable fancy tallow, truck, tank or carlots $5.50 cwt.; yellow grease $5 cwt.

Atlanta: Demand and supply fair; trend steady; stabilized 5¢ lb., f.o.b. Alabama and Georgia producing mills.

New Orleans: Demand fair; trend easy; supply adequate; 6@6½¢ lb., tank cars.

BARLEY FEED

Portland: Demand slow; supply ample; trend unchanged; rolled $63; ground $51.

Los Angeles: Demand slow; trend easier; supply adequate; standard rolled $3.05 cwt.; standard ground $3 cwt., both sacked.

San Francisco: Demand fair; supply ample; rolled $61; ground $60.

Philadelphia: Demand slow; supply fair; $46.

Boston: Demand poor; supply adequate; $44, sacked.

Ogden: Supply good; rolled $47@48; whole barley $42@43.

Denver: Demand good; trend firm; supply fair; rolled $2.05 cwt.

Chicago: Demand fair; trend steady; supply adequate; $38, sacked.

Baltimore: Demand good; trend firm; supply ample; $48.50, sacked.

New Orleans: Demand slow; trend unchanged; supply ample; $51@52, sacked.

Seattle: Demand fair; trend firm; supply good; $47, truck lots.

BENTONITE (SODIUM)

Cincinnati: Demand steady; supply adequate; f.o.b. Cincinnati, minimum 30-ton carlots: 80 granular $31.50; less than car lots $40; 200 mesh fine $31; less than ton lots $40.

Denver: Demand fair; trend steady; supply ample; $24.50 f.o.b. Denver.

Chicago: Demand fair; trend steady; supply ample; f.o.b. Wyoming and South Dakota shipping points: granular, 30 mesh $16.50; fine granular, 50 to 100 mesh $13.75; powder, 200 mesh $13.50, f.o.b. Belle Fourche, S.D., minimum 30-ton carlots, 80 granular $13.50 net; 200 mesh, fine $13.25 net.

BLOOD FLOUR

Louisville: Demand fair; trend steady; supply good; $82.50@87.50, sacked.

BLOOD MEAL

Los Angeles: Demand good; trend firmer; supply tight; $6 a unit of ammonia, sacked.

Omaha: Demand and trend fair; supply ample; 80% $95, sacked, Omaha.

Louisville: Demand fair; trend firm; supply good; $82.50@87.50, sacked.

San Francisco: Demand fair; supply ample; $6 a unit of ammonia, sacked.

Ogden: Supply good; $90 ton in 100-lb. bags, f.o.b. Ogden.

Portland: Demand slow; supply ample; trend unchanged; $112.

Chicago: Demand fair; trend steady; supply ample; 80% protein, 100-lb. sacks $120.

New Orleans: Demand slow; supply ample; trend steady; $82.50@87.50, sacked.

BONE MEAL (STEAMED)

San Francisco: Demand good; supply ample; $75, sacked.

Denver: Demand fair; trend steady; supply ample; $109, Denver.

Ft. Worth: Demand good; supply scarce; $100, sacked, f.o.b. Ft. Worth, local manufacture.

Louisville: Demand slow; trend steady; supply light; $85@90, sacked.

Los Angeles: Demand slow; trend firm; supply limited; imported $81, 20-ton lots, sacked.

Boston: Demand steady; supply light; $105.

Portland: Demand slow; supply ample; trend unchanged; $99.

Cincinnati: Demand good; trend steady; supply fair; $110, sacked, Cincinnati.

New Orleans: Demand fair; trend easy; supply ample; $82.50@87.50, sacked.

Chicago: Demand good; trend higher; supply fair; $102.50, 100-lb. sacks.

Seattle: Demand good; trend firm; supply limited; $90, ex-dock, sacked.

BREWERS DRIED GRAINS

Philadelphia: Demand and supply fair; $52.

San Francisco: Demand fair; supply ample; $54, sacked.

Boston: Demand and supply good; 26% $51; 22% $50.

Louisville: Demand good; trend steady; supply normal; $53, sacked.

Los Angeles: Demand slow; trend unchanged; supply adequate; $50.50.

Ft. Worth: Demand slow; supply sufficient; 26% protein $57.50, sacked, February-March.

Cincinnati: Demand poor; trend lower; supply adequate; $46.

New York: Demand slow; trend lower; supply ample; $50 bulk, $56 sacked, Boston.

St. Louis: Demand fair; trend steady; supply light; $45.

Chicago: Demand poor; trend sharply lower; supply ample; 26% protein $37.50.

New Orleans: Demand fair; trend easy; supply good; $52@53, sacked.

BREWERS DRIED YEAST

Los Angeles: Demand slow; trend unchanged; supply adequate; 10¢ lb., 5-ton lots; 11¢ lb., 1-ton lots; 12¢ lb., less than ton lots; all sacked.

San Francisco: Demand fair; supply good; 10¢ lb., sacked.

Portland: Demand good; trend unchanged; supply ample; 5½¢ lb.

Boston: Demand and supply steady; 10¢ lb.

Omaha: 10½¢ lb.

Louisville: Demand fair; trend firm; supply good; 10@10½¢ lb., sacked.

Denver: Demand light; trend steady; supply ample; 8¢ lb., f.o.b. Golden, Colo.

Cincinnati: Carlots 11¢ lb.; 5 ton lots 11¢ lb.; ton lots 11½¢ lb.

Pittsburgh: Carlots 10¢ lb.; 5-ton lots 11¢ lb.; ton lots 11½¢ lb., all sacked.

New Orleans: Carlots 10¢ lb.; 5-ton lots 11¢ lb.; ton lots 11½¢ lb., all sacked.

New York: Carlots 9½¢ lb.; 10-ton lots 10¢ lb.; 5-ton lots 10½¢ lb.; ton lots 11¢ lb., all sacked, f.o.b. New Jersey.

Chicago: Demand fair; trend steady; supply ample; 9½@10¢ lb., carlots, sacked; 9¾@12¼¢ lb., l.c.l.

Milwaukee: Demand fair; trend steady; supply ample; 10½@12¼¢ lb., ton lots.

St. Louis: Demand fair; trend firm; supply ample; 9½@10¢ lb., carlots, sacked; 10½¢ lb., ton lots; 11½¢ lb., less than ton lots.

Seattle: Demand slow; trend steady; supply ample; $12 cwt., sacked.

BUTTERMILK (CONDENSED)

Los Angeles: Demand slow; trend unchanged; supply adequate; 5½¢ lb., 100-lb. lots in barrels; 4¾¢ lb., 500-lb. lots in barrels.

Philadelphia: Demand slow; supply light; $4.25 cwt.

Louisville: Demand very dull; supply nil; trend steady; $4.25 cwt., paper drums.

Ogden: Supply ample; $4.40, 100-lb. drum.

San Francisco: Demand fair; supply good; $5, drums.

Boston: Demand and supply steady; 3.95¢ lb.

Chicago: Demand and supply fair; trend firm; $3.25@3.50 cwt., barrels.

New Orleans: Demand slow; trend unchanged; supply adequate; $4.15@4.25 cwt.

CALCITE CRYSTALS AND FLOUR
(All prices net, sacked, including freight)

New York: Crystals $16.28, flour $10.28.
Buffalo: Crystals $17.11, flour $11.11.
Toledo: Crystals $15.96, flour $12.96.
Boston: Crystals $17.63, flour $11.63.
Lime Crest, N.J.: Crystals $11.50, flour $5.50.

CALCIUM CARBONATE

Los Angeles: Flour $10.15, 20-ton cars; meal $11.15, 20-ton cars; both sacked.

Cincinnati: Demand fair; trend steady; supply adequate; $7@7.50 cwt.

Minneapolis: Fine grind, 50-lb. bags $12.25, 100-lb. bags $11.50; bulk, boxcar $10; bulk, hopper $9.50; coarse grind $1 premium, delivered Minneapolis.

Chicago: Demand fair; trend steady; supply ample; fine grind, plain, 100-lb. bags $9.54; bulk, in hopper cars $7.54; bulk, in boxcars $8.04; granular grind $1 premium.

Seattle: Demand and trend steady; supply good; $14, ex-warehouse, sacked.

CHARCOAL

San Francisco: Demand steady; supply ample; $141, sacked.

Los Angeles: Demand slow; trend unchanged; supply adequate; hardwood poultry: $156, less than ton lots, sacked; $144.40, ton lots, sacked.

Boston: Demand fair; supply adequate; $110.

Chicago: Demand fair; trend firm; supply fair; 50-lb. multiwalls $110.

COCONUT OIL MEAL

Los Angeles: Demand slow; trend steady; supply adequate; copra cake $85.

San Francisco: Demand good; supply tight; solvent $69.50.

Portland: Demand slow; supply ample; trend unchanged; $80.50.

Seattle: Demand fair; trend firm; supply limited; $86, delivered, truck, sacked.

COD LIVER OIL (FORTIFIED)

Boston: Demand slow; supply ample; 300 D, 3,000 A, 22¢ lb.; 600 D, 2,250 A 20½¢; 300 D, 2,250 A 20¢; 600 D, 1,500 A 19¢; 300 D, 1,500 A 18½¢.

New York: Demand fair; trend steady; supply satisfactory; 1,500 A, 300 D 16½¢ lb.; 3,000 A, 300 D 20¢ lb.

CONDENSED FISH SOLUBLES

Boston: Demand and supply steady; 4¾¢ lb.

Los Angeles: Demand slow; trend weaker; supply adequate; 2½¢ lb.

Denver: Demand poor; trend steady; supply ample; dried $132, Denver.

New York: Demand fair; supply satisfactory; trend unchanged; $45, f.o.b. shipping points.

New Orleans: Demand light; trend easy; supply fair; $42.50@45, f.o.b. Gulf.

CORN GLUTEN FEED AND MEAL
(All quotations for all cities are bulk basis, sacked basis $5 more)

Minneapolis: Feed $47.60, meal $66.60.
Atlanta: Feed $51, meal $70.
Birmingham: Feed $49.60, meal $68.60.
Boston: Feed $52.50, meal $71.50.
Chicago: Feed $41, meal $60.
Cleveland: Feed $48.90, meal $67.90.
Denver: Feed $51.20, meal $70.20.
Ft. Worth: Feed $49.70, meal $68.70.
Indianapolis: Feed $46.20, meal $65.20.
Kansas City: Feed $41, meal $60.
Louisville: Feed $47.60, meal $66.60.
New Orleans: Feed $50.90, meal $69.90.
New York: Feed $52.10, meal $71.10.
Norfolk: Feed $51.50, meal $70.50.
Philadelphia: Feed $51.70, meal $70.70.
Pittsburgh: Feed $49.60, meal $68.60.
St. Louis: Feed $41, meal $60.
Decatur, Ill.: Feed $39.75, meal $58.75.

CORN OIL MEAL

Louisville: Demand slow; trend easy; supply fair; $55.45, sacked.

Cincinnati: Demand fair; trend steady; supply adequate; $49.

COTTONSEED OIL MEAL

Kansas City: Demand slow; trend weak; supply adequate; 41% old process $54, Memphis; 41% new process $54, Memphis.

Louisville: Demand fair; trend steady; supply good; new or old process $64, sacked.

Ft. Worth: Demand fair; supply sufficient; 41% old process $64@65; solvent 2% fat added $61; pellets $2 additional; cottonseed hulls $14.

Boston: Demand slow; supply adequate; $73.

San Francisco: Demand good; supply tight; 41% $71.50; 44% $76.

Philadelphia: Demand slow; trend unsettled; supply fair; $71.

Portland: Demand slow; trend weak; supply ample; $75.

Denver: Demand fair; trend steady; supply ample; 2% $65.40, Denver.

Los Angeles: Demand quiet; trend unchanged; supply adequate; $71@72.

Omaha: Demand poor; trend easy; supply ample; 41% solvent $62.70, delivered Omaha.

Ogden: Supply good; 41% $72@75.

Cincinnati: Demand poor; trend steady; supply adequate; $63.

Memphis: Demand poor; trend steady; supply ample; prime 41% protein, old process $54; new process, 41% solvent $55.50.

Wichita: Demand good; supply sufficient; 41% old process $72.50, sacked.

Chicago: Demand slow; trend lower; supply ample; Memphis: hydraulic $55, solvent $56.

New Orleans: Demand slow; supply ample; trend steady; $71.50@72.50, sacked.

St. Louis: Demand slow; trend easy; supply ample; solvent $58.

Seattle: Demand good; trend steady; supply limited; 41% expeller process $80, delivered, truck lots.

Atlanta: Demand fair; trend steady; supply good; 41% $62, Georgia; $57, Alabama; $54, Mississippi Valley; f.o.b. producing mills.

CURACAO PHOSPHATE

New York: $48 sacked, $46 bulk, f.o.b. New Orleans, Jacksonville or Philadelphia.

D ACTIVATED ANIMAL STEROL (POWDERED)

Cincinnati: Demand fair; trend steady; supply ample; 1,500 ICU 11@12¢ lb.; 3,000 ICU 10¢ lb. warehouse.

Kansas City: Demand fair; trend steady; supply adequate; 1,500 ICU 9¾¢ lb.; 3,000 ICU 11¢ lb.

D ACTIVATED PLANT STEROL (POWDERED)

Chicago: Demand fair; supply ample; 4,000,000 U.S.P. units per lb., 15¢ lb. in ton lots, less than ton lots 17¢ lb.; 12,000,000 units per lb., 5 tons to a carload 28¢ lb., ton lots and less 30¢ lb.

DEFLUORINATED PHOSPHATE

Houston: Minimum phosphorus 19%, minimum calcium 32%, maximum calcium 36%, maximum fluorine .19% $74.35 net ton, f.o.b. Houston; 100-lb. multiwall bags $71.35, bulk.

Tupelo, Miss.: Minimum phosphorus 14%, minimum calcium 28%, maximum fluorine .14% $57.07, f.o.b. Tupelo in 100-lb. multiwall bags, $54.07, bulk.

Wales, Tenn.: Minimum phosphorus 18%, minimum calcium 33%, maximum 36%, maximum fluorine .18% $71.80 (or $3.99 per unit of P), f.o.b. Wales in 100-lb. multiwall bags, $3 less in bulk.

Coronet, Fla.: Carload, bagged $66.25 and bulk $63.25; truck load, bagged $67 and bulk $64, f.o.b. Coronet, Fla.

Cincinnati: 18% phosphorus $81.02; 14% phosphorus $71.03, f.o.b., Cincinnati.

DICALCIUM PHOSPHATE

Trenton, Mich.: 18½% P $82, bulk, boxcar/hopper car; $86, bagged, in carloads or truckloads; $96, bagged, in less than carload lots; 21% P, $94.65, bulk, boxcar/hopper car; $97.64, bagged in carloads or truckloads; $107.65, bagged, less than carload; all prices f.o.b. Trenton, freight equalized with nearest producing point.

Chicago: Bulk 18.5% phosphorus, carlots or trucks $83; 20,000 lb. or more $86 net ton in 100-lb. papers; less than 20,000 lb. $96, basis Chicago Heights, Ill., or Nashville, Tenn.; 21% phosphorus, carlots or trucks, bulk $94.65; 20,000 lb. or more, per net ton in 100-lb. papers, $97.65 and less than 20,000 lb., $107.65, basis Chicago Heights, Ill., or Nashville, Tenn.

Bonnie, Fla.: Minimum phosphorus 18½%, granular, $86 (or $4.65 unit of P), freight equalized from nearest producing point, carload basis; bulk carloads $3 less; in truck loads of less than 10 tons, $10 more. Western slope prices: for delivery at established railroad stations and by truck at regular feed mixing plants: California, Arizona, Nevada and Utah, $99.90; Washington, Oregon, Montana and Idaho, $107.15; buck carloads $3 less; truck loads less than 10 tons, $10 more.

Columbia, Tenn.: Minimum phosphorus 18½%, minimum 25% calcium, maximum .01% fluorine guaranteed $83.25, f.o.b. Columbia, in 100-lb. multiwall bags; freight equalized with nearest producing point, carload basis; bulk $3 ton less.

Texas City, Texas: Carload and truckload, bagged $80.50, bulk $77.50, f.o.b. Texas City, Texas.

Portland: Demand slow; supply ample; trend unchanged; $112.

Denver: Demand fair; trend steady; supply ample; $95.80, f.o.b. Denver.

Cincinnati: 18½% phosphorus $92.15 f.o.b. Cincinnati.

DISTILLERS DRIED GRAINS

Louisville: Demand good; trend steady; supply fair; bourbon grains: light $59, dark $60, solubles $77, all sacked.

San Francisco: Demand fair; supply ample; solubles $85, sacked.

Philadelphia: Demand dull; supply light; $63.

Boston: Demand active; supply tight; light $63.

Cincinnati: Demand poor; trend steady; supply adequate; $51.50, truck.

Seattle: Demand good; trend firm; supply limited; $68.50, delivered, truck lots, sacked.

DRIED BEET PULP

San Francisco: Demand good; supply fair; $45.20.

Portland: Demand good; supply ample; trend unchanged; $56.40.

Ogden: Supply ample; $41@46.

Ft. Worth: Demand slow; supply sufficient; 50 lb. papers $54, 30 days' shipment, delivered Ft. Worth.

Los Angeles: Demand slow; trend unchanged; supply adequate; $47.80@49.40.
Boston: Demand slow; supply ample; $53, sacked.
Denver: Demand excellent; trend very strong; supply nil; $32.50, bulk, f.o.b. Colorado factories; $45.50, pellets, f.o.b. Colorado factories.
Atlanta: Demand practically nil; trend steady; supply limited; $58, sacked, delivered.
New Orleans: Demand fair; trend steady; supply adequate; $52@53, sacked.
Seattle: Demand good; trend firm; supply limited; $52, delivered, carlots, sacked.

DRIED BUTTERMILK

Los Angeles: Demand slow; trend unchanged; supply adequate; 12¢ lb., sacked.
San Francisco: Demand fair; supply ample; 11¼¢ lb.
Louisville: Demand slow; trend steady; supply normal; 13½@14¢ lb., sacked.
Ogden: Supply ample; $17.25 cwt.
Boston: Demand good; supply short; 14¢ lb.
Chicago: Demand good; trend firm; supply fair; medium acid $12@12.50 cwt., sacked; sweet cream $12@12.50.
New Orleans: Demand fair; trend steady; supply ample; $14@14.50 cwt.

DRIED CITRUS PULP

Los Angeles: Demand slow; trend weaker; supply increased; orange pulp $41; lemon pulp $40.
San Francisco: Demand and supply fair; sacked, f.o.b. Florida.
Boston: Demand slow; supply ample; $30, $49, sacked.
Atlanta: Demand good; trend strong; supply limited; pulp $32.50, sacked, f.o.b. Florida producing plants; meal $35, sacked.
New Orleans: Demand fair; trend easy; supply normal; $32.50@36, f.o.b. Florida points.

DRIED SKIM MILK

Louisville: Demand slow; trend firm; supply ample; 13½@14¢ lb., sacked.
Los Angeles: Demand slow; trend unchanged; supply adequate; 15¢ lb., less than ton lots, sacked; 14¾¢ lb., ton lots, sacked.
San Francisco: Demand and supply fair; 13½¢ lb., sacked.
Philadelphia: Demand slow; supply light; $12.25 cwt.
Ogden: Supply ample; $15.15, 100-lb. drum.
Boston: Demand active; supply very short; 13¢ lb., nominal.
Cincinnati: Demand fair; trend steady; supply adequate; 13@14¢ lb., sacked.
Minneapolis: Supplies up; demand off; weaker undertone; $13.50@13.75 cwt., sacked.
Chicago: Demand quiet; trend steady; supply ample; $12@12.50 cwt., sacked.
New Orleans: Demand slow; supply ample; trend unchanged; $14@14.50 cwt.

DRIED WHEY

Portland: Demand slow; supply ample; trend unchanged; $5.50 cwt.
Ft. Worth: Demand fair; supply adequate; carlots, standard $6, sacked, delivered Ft. Worth; $6.35 ton lots, f.o.b. warehouse Ft. Worth.
Ogden: Supply fair; $6, 100-lb. bag, sacked.
San Francisco: Demand steady; supply good; $5.75 cwt., sacked.
Los Angeles: Demand slow; trend unchanged; supply adequate; $5.93 cwt., carloads, sacked; $6.23 cwt., l.c.l., sacked.
Philadelphia: Demand slow; supply light; $6.50 cwt.
Denver: Demand fair; trend steady; supply ample; $6.50 cwt.
Boston: Demand and supply steady; 5½¢ lb.
Louisville: Demand slow; trend firm; supply ample; 6½¢ lb., sacked.
Cincinnati: Demand fair; trend steady; supply adequate; $6 cwt., sacked.
Minneapolis: Demand good; supply adequate; price steady at $5.40@5.50 cwt.
Kansas City: Demand fair; trend steady; supply adequate; regular or partially delactosed $5.50 cwt., producers' points.
Wichita: Demand light; supply ample; $6.50 cwt., sacked.
Chicago: Demand and supply fair; trend steady; $5.75@6 cwt., sacked.
Seattle: Demand and trend steady; supply good; $6.40 cwt., exwarehouse, l.c.l.
New Orleans: Demand fair; trend easy; supply ample; $6@6.50 cwt., sacked.

FEATHER MEAL (HYDROLYZED)

Los Angeles: Demand slow; trend unchanged; supply adequate; $1 unit of protein, sacked.
Ft. Worth: Demand good; supply scarce; 85%-87% protein $70@75, sacked, f.o.b. truckr north Texas plants.
Boston: Demand and supply steady; $80, sacked.
Salisbury, Md.: Demand spotty; supply ample; $86, f.o.b.
Atlanta: Demand fair; trend steady; supply limited; $78.50, f.o.b. Georgia and Alabama producing mills.

FISH MEAL

Boston: Demand slow; supply good; $117, sacked.
Omaha: Demand fair; trend firm; supply ample; 60% menhaden $130, f.o.b. Omaha.
Los Angeles: Demand slow; trend weaker; light offerings but adequate; local production, 60% protein $1.70@1.75 a unit, sacked.
Denver: Demand fair; trend steady; supply ample; $1.75 a unit protein, f.o.b. West Coast.
Cincinnati: Demand fair; trend steady; supply adequate; $146.
Louisville: Demand slow; trend steady; supply light; $148, sacked.
Ft. Worth: Demand fair; supply sufficient; 65% protein $112, sacked, delivered Ft. Worth.
Ogden: Supply ample; $1.70 a unit, f.o.b. Coast; 65% $116@117.
San Francisco: Demand slow; supply ample; $1.70 a unit protein, sacked.
Portland: Demand slow; trend lower; supply ample; $1.65 a unit.
Minneapolis: Market leveling off; no change from last week; Gulf menhaden steady at $130@133, sacked, truck lots; 70% herring $1.60 a unit protein, f.o.b. West Coast; 60% blended steady at $129@132, sacked, delivered Minneapolis.
Atlanta: Demand fair; trend weak; supply good; 60% menhaden $105@110, sacked, f.o.b. Atlantic and Gulf ports.
Chicago: Demand slow on eastern menhaden, good on Gulf menhaden; trend mixed; eastern menhaden, meal $103@110 and scrap $99@106; Gulf menhaden, meal $108@115 and scrap $104@111; Canadian herring meal $1.60@1.75 a unit of protein.
New York: Demand quiet; trend about steady; supply adequate; 60% menhaden meal $110, f.o.b. shipping points.
New Orleans: Demand dull; trend easy; supply ample; menhaden, 60% $110@115, sacked; scrap $106@111, sacked, f.o.b. Gulf.
Seattle: Demand and supply good; trend firm; $1.95 a unit protein, delivered, truck lots, sacked (Canadian production).

HAY

Denver: Demand and supply fair; trend good; new hay, first cutting $31; new hay third cutting $31@32, alfalfa baled.
Boston: Demand seasonal; supply adequate; No. 3 timothy baled $40@42.
Ogden: Supply good; $25, in the barn.
Los Angeles: Slow demand with limited offerings; U.S. No. 1 $43@44; U.S. No. 2 leafy $40@41; U.S. No. 2 green $41@42; U.S. No. 2 $37@39.
Louisville: Demand dull; trend steady; supply good; No. 1 hay, any variety $30@35, No. 2 $28@30; straw $18@20.
Portland: Demand good; supply limited; trend unchanged; $39.
Ft. Worth: Demand fair for alfalfa, very slow for prairie and Johnson Grass; supply sufficient; carlots, baled, No. 1 alfalfa $40@42; No. 2 $38@40; No. 2 prairie $24@26; No. 3 Johnson $32@24, delivered Texas common points.
Cincinnati: Demand poor; trend steady; supply adequate; No. 1 timothy $24@25; alfalfa clover mixed $27.50; No. 1 red clover $26@27; alfalfa, first cutting $32, second cutting $25; wheat or oat straw $18@20.
Wichita: Demand good; supply insufficient; prairie $23@25, alfalfa $33@34, baled.
Seattle: Demand good; trend easy; supply fair; U.S. No. 2 green alfalfa $40, delivered truck lots, baled.
Philadelphia: Demand slow; supply light; $24@25.

HOMINY FEED

Boston: Demand slow; supply plentiful; $48.50.
Louisville: Demand dull; trend steady; supply normal; $42, sacked.
Kansas City: Demand slow; trend steady; supply adequate; yellow or white $32.50@33.
Cincinnati: Demand poor; trend lower; supply adequate; $41.
Chicago: Demand quiet; trend easier; supply adequate; $39.
New Orleans: Demand fair; trend steady; supply ample; $46.50@48.50, sacked.
St. Louis: Demand slow; trend steady; supply ample; yellow $38.
Memphis: Demand poor; trend steady; supply ample; white $40.50, yellow $40.50.
Seattle: Demand fair; trend steady; supply limited; $54, delivered carlots, sacked.

LINSEED OIL MEAL

Boston: Demand slow; supply ample; 34% $52.50.
Ft. Worth: Demand slow; supply sufficient; 34% protein, solvent $52.50, rail.
Philadelphia: Demand and supply fair; 34% $54.
Los Angeles: Demand slow; trend unchanged; supply adequate; local production, 31% protein $75, nominal.
Kansas City: Demand poor; trend weak; supply plentiful; solvent process $64.50@65, Minneapolis; old process $73.50, Minneapolis.
Omaha: Demand slow; trend easy; supply ample; 34% solvent $70.80, bulk; 32% old process $79.30, Omaha basis.
Louisville: Demand slow; trend easy; supply light; old process $93, sacked; new process $84, sacked.
San Francisco: Demand fair; supply ample; $78.50.
Portland: Demand slow; trend firm; supply limited; $91.
Denver: Demand poor; trend steady; supply fair; $51.30, Denver.
Cincinnati: Demand poor; trend steady; supply adequate; new process $66; old process $75.50, Minneapolis.
Minneapolis: Market still sliding; new process down another $1 from last week at $66, immediate; old process off $1.50 at $43.50.
Chicago: Demand quiet; trend easier; supply ample; Minneapolis: solvent $55, expeller $74.
New Orleans: Demand slow; trend easy; supply ample; $55.50@57.50, sacked.
Wichita: Demand fair; supply sufficient; 34% $56.50, sacked.
Seattle: Demand fair; trend steady; supply limited; 31% protein (California) $91, delivered, carloads, sacked.

LIVER AND GLANDULAR MEAL

Omaha: Demand fair; trend fair; supply short; 65% $180, sacked, Omaha.

MALT SPROUTS

Boston: Demand and supply limited; $48, sacked.
Cincinnati: Demand fair; trend steady; supply adequate; No. 1 $46.
Chicago: Demand moderate; trend firm; supply ample; $32.50.
New Orleans: Demand fair; trend easy; supply ample; $43.50@45, sacked.

MEAT AND BONE MEAL

Ft. Worth: Demand fair; supply moderate; meat and bone, 50% $75@76, f.o.b. Ft. Worth.
Louisville: Demand slow; trend steady; supply good; $82.50@87.50, sacked.
Kansas City: Demand fair; trend steady; supply ample; 50% $67.50.
Omaha: Demand and trend fair; supply ample; $75.
Los Angeles: Demand slow; trend unchanged; supply adequate; 50% protein $1.70 a unit.
Portland: Demand slow; supply ample; trend unchanged; $1.40 a unit.
Boston: Demand slow; supply ample; $1.20 a protein unit; converted 50% $72.50.
Cincinnati: Demand good; trend easy; supply fair; 50% meat and bone scrap $76.50, Cincinnati.
San Francisco: Demand fair; supply ample; $1.55 a unit protein.
Ogden: Supply ample; $80 ton, 50% protein, 100-lb. bags.
Denver: Demand fair; trend little soft; supply ample; 50% $67.50, sacked, truck lots; $64.50, bulk.
St. Paul: Demand still slow; supply adequate; wider range in price than last week, $1 each way; $69@75.
St. Louis: Demand slow; trend easy; supply ample; $70.
Wichita: Demand good; supply insufficient; 50% $83, sacked, f.o.b. plant; 55%, no quotations, no offerings.
Chicago: Demand fair; trend easier; supply ample; 50% protein, 100 lb. sacks $77.50.
New York: Demand fair; trend lower; supply adequate; 50% $70, sacked; 55% $77.50, sacked.
New Orleans: Demand slow; trend easy; supply ample; $82.50@87, sacked.
Seattle: Demand good; trend steady; supply ample; 50% protein $77.50, ex-warehouse, sacked.

MILLFEED

Minneapolis: Demand slow; supply adequate; middlings off $1 from last week, $35.50, sacked; bran steady at $38@38.50, sacked; red dog off 50¢, $41.50, jutes.
Kansas City: Demand good; trend steady; supply of sacked tight, bulk ample; sacked bran $34.50@35, bulk bran $28.50@29, sacked shorts $34.50@35; bulk shorts $30@30.50; bulk middlings $29.50@30.
Wichita: Demand fair; supply sufficient; basis Kansas City: bran $34.50@35, shorts $34.50@35, sacked.
Ft. Worth: Demand fair; offerings light for immediate shipment; bran $38.50, burlaps $43.50; gray shorts $40.50, burlaps $43.50; bulk middlings $39.50, delivered Texas common points.
Chicago: Millfeed demand last week was down, with offerings more than ample. Both bran and middlings dropped about $2. Demand for commercial mixed feeds saw very moderate improvement. Quotations: carlots, per ton, bulk, Chicago—standard bran $34.50, middlings $35.50, red dog $42.50@44.50.
St. Louis: Demand slow; trend easy; supply ample; bran $33.50@34, middlings $34.50@35.
Omaha: Demand fair; trend easy; supply ample; sacked bran $35; sacked gray shorts $35; bulk standaard midds. $32; all Omaha basis.
Cincinnati: Demand poor; trend lower; supply adequate; bran $41, middlings $41.
Boston: Demand slow; supply plentiful; bran and middlings $47.50.
Philadelphia: Demand spotty; trend unsettled; supply fair; bran $47, standard midds. $47.50, red dog $52.
New Orleans: Demand good; trend easy; supply ample; sacked, bran $46.25@47, shorts $46.25@47; bulk, bran $42.25, shorts $41.75@42.50, middlings $40.75@41.50.
Memphis: Demand fair; trend steady to lower; supply ample; wheat bran $36.70, gray shorts $38.70, standard midds. $37.70.
Louisville: Demand fair; trend weak; supply good; bran $46.10; mixed feed $46.60; shorts $47.60; middlings $48.50, all sacked.
Seattle: Demand fair; trend easy; supply good; $56, delivered common transit points, carlots.
Portland: Demand fair; supply ample; trend unchanged; $36.
Ogden: Supply ample; to Utah and Idaho: red bran and mill run $36, middlings $41; to Denver: red bran and mill run $43, middlings $48; to California: red bran and mill run $43.50, middlings $48.50, f.o.b. San Francisco and Los Angeles.
Denver: Demand slack; trend steady; supply adequate; shorts $38, bran $38, mill run $38.
Los Angeles: Standard mill run $41.50@42, slow demand, weaker trend, ample supplies; red bran $46@47, slow demand, weaker trend, ample supplies.
San Francisco: Demand slow; supply ample; millfeed $41.50; red bran $52.50.

MINERAL FEED

San Francisco: Demand steady; supply good; all-purpose with iodine $70, sacked.
Ft. Worth: Demand fair; supply sufficient; all-purpose granules $90, block $97; mineral phosphorus 6% granules $106, block $113; cattle-sheep mineral, 7% phosphorus, granules $100, block $107; hog mineral phosphorus, 2½% granules $87, phosphorus 2% $77 (all in 50 lb. paper bags).
Portland: Demand slow; supply ample; trend unchanged; $42.
Ogden: Supply good; $112 ton in 50-lb. blocks; $103 ton, granular, 50-lb. bags.
Denver: Demand fair; trend steady; supply ample; $100.
Wichita: Demand heavy; supply adequate; all-purpose with iodine 50 lb. blocks $97.50; 100 lb. bags $92.50, f.o.b. plant.
Sioux City: 50-lb. mineral blocks 8.2% phosphorus $93; 7.5% phenothiasine sheep mineral blocks $4 each.
Seattle: Demand fair; trend steady; supply good; mixer-mineral $48, ex-warehouse, sacked; all-purpose mineral $85, ex-warehouse, sacked.

MOLASSES

Minneapolis: Trend steady; $28.50, tank truck, delivered.
San Francisco: Demand and supply good; $20, f.o.b. cars, Richmond, Cal.
Boston: Demand active; supply plentiful; 14¢ gal., tank cars.
Denver: Demand fair; trend steady; supply ample; 9½¢ gal., New Orleans; $16.24 ton, New Orleans; $20, West Coast.
Kansas City: Demand fair; trend steady; supply ample; blackstrap 9½¢ gal., f.o.b. tank car, New Orleans.
Ft. Worth: Demand good; supply sufficient; blackstrap 10¢ gal., f.o.b. Houston; delivered Ft. Worth, truck, $23.80, seller's market price on date of shipment.
Louisville: Demand fair; trend easy; supply normal; 9½¢ gal., tank cars, f.o.b. Gulf ports.
Los Angeles: Demand good; trend unchanged; supply ample; $20, f.o.b. tank cars; $20.25, f.o.b. tank trucks.
Cincinnati: Demand good; trend steady; supply adequate; 9¾¢ gal., New Orleans.
Memphis: Demand fair; trend steady; supply ample; blackstrap 9¾¢ gal., tank car, f.o.b. New Orleans; $22.27 ton, delivered Memphis, truck.
St. Louis: Demand slow; trend steady; supply ample; 9½¢ gal., tank cars, New Orleans.
Atlanta: Demand fair; trend steady; supply ample; citrus $15@17, f.o.b. Florida producing mills.
New York: Demand moderate; trend easier; supply adequate; 14¢ gal., Albany.
New Orleans: Demand good; supply ample; trend steady; 9¾@10¢ gal., tank cars and trucks; 600-lb. customers' drums $6.92.
Seattle: Demand fair; trend easy; supply good; $20.25, f.o.b. Seattle, tank truck lots.

NIACIN

New York: 50% $1@1.20 lb.

OAT PRODUCTS

Minneapolis: Demand very slow; feeding rolled down $1 at $32; feeding oatmeal steady at $69; pulverized off $1.50 at $46; reground oat feed steady at $26; crimped off $1 at $61, all sacked prices.
Boston: Demand fair; supply adequate; white pulverized, sacked $59; reground oat feed, sacked $31.
Ft. Worth: Demand slow; supply moderate; oat millfeed $51.70; reground $32.75, February, sacked, new jutes.
Portland: Demand slow; supply ample; trend unchanged; rolled $60, ground $62, cleaned $60.
Louisville: Demand slow; trend strong; supply normal; reground $30.30, rolled oats $59.90, feeding meal $51.80, pulverized oats $54.30, crimped oats $59.80, all sacked.
Philadelphia: Pulverized white, demand slow, supply fair, $54; domestic, demand slow, supply light, $31; Canadian oat feed, demand slow, supply light, $35, sacked.
Los Angeles: Demand slow; trend firm; supply scarce; local production, pulverized $69, sacked.
Cincinnati: Demand fair; trend steady; supply adequate; reground oats $30; pulverized white oats $52.50, sacked.
Chicago: Demand fair; trend steady; supply adequate; reground oat feed $19.50; No. 1 fine ground feeding oatmeal $77; feeding rolled oats $78@80.50.
Memphis: Demand poor; trend lower; supply ample; 3½% protein, reground oat feed $28.75.
Seattle: Demand good; trend firm; supply fair; $56, delivered truck lots, 38-lb. or better.

OYSTER SHELL

Louisville: Demand and supply good; trend firm; in 80-lb. paper sacks $23.45; in 50-lb. paper sacks $23.70; in 25-lb. paper sacks $25.95.
Portland: Demand slow; supply ample; trend unchanged; western $31, eastern $36, granite grits $25, shell flour $21.
Los Angeles: Demand slow; supply ample; trend unchanged; $14.80.
San Francisco: Demand fair; supply ample; local $15, eastern $26.
Boston: Demand and supply steady; $26, paper.
Cincinnati: Demand fair; trend steady; supply adequate; $24.45, sacked.
New Orleans: Demand and supply good; trend steady; $24@24.50, papers.
Seattle: Demand and trend steady; supply good; eastern $36, delivered, carlots, sacked.

PEANUT OIL MEAL

Atlanta: Demand and supply fair; trend steady; 45% $59, expeller; $57, solvent process, f.o.b. Georgia and Alabama producing mills.

PEAT MOSS

Portland: Demand slow; supply ample; trend unchanged; $3.30 bale.
San Francisco: Demand and supply fair; $3.65 bale.
Philadelphia: Demand slow; supply fair; $2.90 bale, f.o.b. pier.
Boston: Demand and supply steady; $3.15 bale, cariots.
Los Angeles: Demand steady; trend unchanged; supply ample; Canadian 5.6 cu. ft. bales $3.65.
Cincinnati: Demand and supply good; trend steady; truck lots $3.45 bale, f.o.b. Cincinnati.
Chicago: Demand fair; trend steady; supply adequate; standard 7½ cu. ft. bales $3.50.
Seattle: Demand and supply good; trend firm; $2.85 bale, delivered, truck lots.

POTASSIUM IODIDE, U.S.P.

Cincinnati: Demand good; trend steady; 90% KI in calcium stearate or carbonate mixtures: 250-lb. drums $1.25; 200 lb. in 100-lb. drums $1.35; 100-lb. drums $1.38; 25-lb. drums $1.41, f.o.b. Cincinnati.
Chittenango, N.Y.: Demand good; trend firm; supply ample; standard blends, 90% KI, 10% stearate or carbonate mixture, 100 lb. drums $1.32 lb.; 200 lb. and up $1.30 lb., all delivered.

POULTRY BY-PRODUCTS

Ft. Worth: Demand good; supply scarce; 55% protein $62.50@65, sacked, f.o.b. north Texas plants.
Los Angeles: Demand good; trend firm; supply tight; $1.50 a unit of protein.
Boston: Demand fair; supply spotty; $69, f.o.b. shipping points.
Salisbury, Md.: Demand excellent; supply limited; meal $90, f.o.b.
Atlanta: Demand good; trend steady; supply limited; meal $79, f.o.b. Georgia and Alabama producing mills.

RIBOFLAVIN

Cincinnati: Trend steady feed grade (in feed supplements) 4¢ gram in less than ton lots, in 3.36 to 10 gm./lb. mixtures;

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3¢ in ton lots or more; freight prepaid or paid to destination.

New York: $40 kilo in 4 and 16 gm./lb. mixtures.

RICE BY-PRODUCTS

Los Angeles: Demand slow; trend unchanged; supply adequate; California production, high fat content, bran $52, sacked.

Ft. Worth: Demand slow; supply limited; rice bran $35, f.o.b. south Texas rice mills; hulls $3.50, sacked, f.o.b. mills.

San Francisco: Demand good; supply ample; bran $45, polished $49, both sacked.

Atlanta: Demand fair; trend steady; supply limited; bran $45, sacked, delivered.

SCREENINGS

Ft. Worth: Demand good; supply limited; ground mixed grain $28.50@29.50.

Minneapolis: Demand slow; supplies still tight; some softening in bidding prices; Canadian steady at $28, Duluth; domestic ranges down $3; lights $13@23, mediums $24@33, heavies $34@43.

Cincinnati: Demand fair; trend steady; supply adequate; unground screenings $25.50@27.50.

Chicago: Demand good; trend firm to higher; supply light; ground grain screenings $38.50; Canadian $33.50.

SOFT PHOSPHATE WITH COLLOIDAL CLAY

(Sacked)

Atlanta: $20.40@20.67.
Buffalo: $25.31@25.45.
Chicago: $24.77@24.90.
Cincinnati: $23.47@23.60.
Des Moines: $25.23@25.36.
Kansas City: $24.88@25.
Memphis: $22.20@22.47.
Minneapolis: $25.92@26.06.
Philadelphia: $24.33@24.95.
St. Louis: $24.14@24.27.

SORGHUMS

Ft. Worth: Demand light; supply sufficient; No. 2 yellow milo $2.03@2.04, delivered Texas common points.

Los Angeles: Demand steady; trend weaker; supply ample; milo $2.15 cwt.

Ogden: Supply normal; milo $42@43.

Seattle: Demand and supply good; trend steady; milo $46, delivered, carlots.

SOYBEAN OIL MEAL

Denver: Demand very poor; trend steady; supply ample; $68, Denver.

Kansas City: Demand slow; trend steady to weak; supply plentiful; 44% solvent process $53.50@54, Decatur.

Los Angeles: Demand slow; trend weaker; supply ample; $77.90.

Minneapolis: Quiet demand; downward trend; 44% off $1 from last week at $49.

Omaha: Demand slow; trend easy; supply ample; 44% $59.60, delivered Omaha.

Louisville: Demand slow; trend easy; supply good; $67, sacked.

Ft. Worth: Demand fair; supply sufficient; 44% $65.70 February-March, $65 April-July; 50% protein $72.50 February-March, $72 April-July; trucks: 44% $67@68; 50% protein $74@75.

Philadelphia: Demand and supply fair; 44% $55, Decatur.

San Francisco: Demand fair; supply ample; $77.40.

Portland: Demand slow; trend lower; supply ample; $51, f.o.b. Decatur.

Ogden: Supply good; 44% protein $79@80.

Boston: Demand slow; supply plentiful; 44% $53.50; 50% $59.50; f.o.b. Decatur.

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Cincinnati: Demand poor; trend lower; supply adequate; $57@58, Decatur.

Seattle: Demand good; trend weak; supply ample; $78, delivered, carlots.

Chicago: Soybean oil meal dropped some, and bean meal futures for March delivery dropped about 25¢ ton. More distant bean meal futures were up from 50¢ to around $1.25 ton for the week. Quotations: per ton, bulk, carlots, Decatur—44% protein, unrestricted billing $57.50 and eastern restricted $63.50; 50% protein, unrestricted $63 and eastern restricted $68.50.

Atlanta: Demand fair; trend weak; supply good; 44% $65, delivered.

Memphis: Demand slow; trend steady; supply ample; prime 44% solvent $59.50, f.o.b. Memphis.

Wichita: Demand good for sacked, fair for bulk; supply ample; 44% $67, 50% $73, sacked; 44% $64, 50% $70, bulk, f.o.b. Wichita.

St. Louis: Demand slow; trend easy; supply ample; 44% $60.

New Orleans: Demand slow; trend easy; supply ample; $69@76, sacked.

TANKAGE

Ft. Worth: Demand fair; supply light; 60% digester $30, Ft. Worth.

Omaha: Demand good; trend firm; supply short; $50.

Louisville: Demand slow; trend firm; supply good; 60% $52.50@57.50, sacked.

St. Paul: Demand slow; supply ample; $3 below last week at $68@72.

Kansas City: Demand fair; trend steady; supply ample; 60% digester $70@72.50.

Cincinnati: Demand fair; trend easy; supply good; 60% digester $79, Cincinnati.

New Orleans: Demand dull; trend steady; supply good; 60% protein $82.50@85, sacked.

Chicago: Demand fair; trend easier; supply ample; 60% protein, 100-lb. sacks $77.50.

St. Louis: Demand slow; trend easy; supply ample; $70.

Wichita: Demand good; supply insufficient; 60% $83, f.o.b. plant.

VEGETABLE AND ANIMAL FAT (HYDROLYZED)

Ft. Worth: Demand good; trend strong; supply light; 4½¢ lb., f.o.b. north Texas area.

VITAMIN E FEED SUPPLEMENT

Cincinnati: Demand good; trend steady; any quantity in 100 lb. drums $1.50; in 25 lb. drums $1.55; freight allowed to destination.

WHEAT GERM MEAL

Minneapolis: Demand good; supply tight; $54, jutes.

New Orleans: Demand fair; trend easy; supply ample; $62@64, cottons.

MIDWEST

(Continued from page 119)

complaints from a group that we did not list a certain substance or a particular use of it on a white list when that group took no initiative in advising us of their interest in the particular matter or otherwise bringing the subject to our attention," he commented.

Mr. Kneeland also suggested that in many cases it may be simpler to get a chemical approved as a food additive than to establish that it is generally recognized as safe. To get additive approval requires showing only to the FDA group of scientists that the proposed use is safe and otherwise legal, he explained. Many scientists must be consulted to achieve general recognition of safety.

Current FDA thinking about the Delaney clause, he said, can best be presented by referring to the statement made by Arthur S. Flemming, secretary of health, education and welfare before a House committee on Jan. 26 (Feedstuffs, Jan. 30). The secretary at that time called for an end to the "grandfather clause" as it applies to use of feed additives and also for provisions which would allow suspected carcinogens to be included in feed if they do not harm the animal and leave no residue in food.

An up-to-now "very modest" regulatory program on medicated feeds will be expanded, Mr. Kneeland said. He referred to factory inspection procedures for the feed industry, involving detailed checking of equipment, procedures, compliance with labeling and other steps described in the FDA inspector's manual.

"Your industry and the FDA have, in many instances, reached formal agreements about how you will conduct your business," he said. "You have done this in new drug applications, in requests for exemptions under the antibiotic regulations and in petitions for food additive regulations.

"You have a very important responsibility to follow the commitments that have been made in these various types of applications. We also have a legal responsibility to determine whether you are in fact so doing. If we are to continue to enjoy the benefits of scientific advancement in this field, all of us must be in the position to assure the public it is receiving adequate protection. Enforcement of the pure food and related laws must keep pace with rule making."

TOMORROW'S SWINE FORMULAS—"Tomorrow's swine nutrition research goal is to establish more definitive nutritional requirements for the different stages of the life cycle and to specially design tomorrow's rations for specific feeding purposes within each stage of the life cycle without overfeeding or underfeeding nutrients," Dr. Damon V. Catron, Iowa State University, said.

"There are many gaps in our knowledge of the nutritive requirements of swine throughout the entire life cycle," Dr. Catron said. "To date, most of these gaps have been filled with 'guesstimated' figures which need refinement to achieve greater efficiency. We'll have a better understanding of the basic functions of different nutrients and additives and their interrelationships in metabolism."

Dr. Catron also made these predictions:

1. Swine formulas will be built around crops which produce high yields per acre and lend themselves to mechanized production and harvesting.

2. The future holds unlimited opportunities for development of safe feed additives developed for specific purposes — controlling estrus, embryonic survival, lactation, feed consumption, temperature adaptation, diseases, parasites, carcass quality and many other biological functions in the animal. Present legal restrictions on the use of scientifically safe feed additives must be resolved for the benefit of everyone.

3. Leaner carcasses can be produced by limited feeding. Europeans do this by hand feeding, but Americans will accomplish this by palatability-controlled rations and/or by automatic meter-proportioned grain and balanced supplements at the feed lot. Tomorrow's formulas will be palatability-controlled by processing and special "appetite-control" additives.

4. Tomorrow's rations will be more carefully balanced, supplemented with enzymes or specially processed (such as predigested) to improve nutrient availability.

5. Tomorrow's formulas will have built-in intestinal flora control by the use of certain kinds and levels of ingredients, nutrients and additives (chemotherapeutics, cultures and inoculums).

6. Formulas also will be cost-controlled for maximizing both performance and profit.

7. Some of tomorrow's formulas will be designed for manufacturing feeds to be fed in liquid form. This does not necessarily mean a return to the "old slop barrel," but rather the bulk delivery of dry, meal-type rations to the farm where they will be mechanically mixed with water in tanks, then pumped at time intervals into simple feeding troughs. Developments in automation make liquid rations look more practical primarily for growing-finishing swine.

8. Formulas and feeding programs will be designed for, sold and serviced to pork producers operating more carefully-managed, fully-capitalized, highly-efficient units.

9. Only complete rations will be fed from farrowing to 50 lb., and for maximum cost and performance control, suppiements will be either ground and mixed into complete rations or meter-proportioned in with grain automatically at the feed lot.

10. Present research indicates that heritability for carcass leanness varies from 14 to 76%, and breeders find it difficult to maintain high "fixed" heritability for carcass leanness. Most animal husbandry people have "sold short" the roles played by nutrition and its management in producing leaner pork.

FORMULATION OF POULTRY FEEDS FOR TOMORROW—"Tomorrow's poultry feed formulas may be very largely concentrates," Dr. J. R. Couch, Texas A&M College, predicted. "All feed manufacturers are

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aware of the trend toward the increased usage of concentrates and the decrease in the volume of the complete formula delivered to the poultryman or turkey raiser. It is predicted that the usage of concentrates for all purposes will increase in the future."

Dr. Couch said that more attention must be given to the formulation of concentrates so as to guarantee that the proper levels of vitamins, minerals, growth stimulants and micronutrients are included in the concentrate. Too often, he said, there is a tendency to depend on "one shot" of vitamins in a concentrate when two or three times the usual fortification levels are necessary if an adequate supply of vitamins is to be found in the finished feed.

The speaker made these additional predictions: Additional future improvements will be made to increase the growth rate of turkeys and chickens along with a concurrent improvement in feed conversion. More attention will be given to purchasing feeds based on nutritional performance. Likewise, more attention will be given to rearing pullets that are to be used for the production of eggs, particularly with regard to the environment in which the birds are maintained, the management during the growing season and use of some type of caloric intake program.

In discussing past advances in the feed industry, Dr. Couch commented that the development of the present broiler industry can very largely be attributed to the development of an effective coccidiostat. There are a number of coccidiostats available and other new ones are no doubt in the process of being developed.

Dr. Couch predicted that the levels of vitamins in tomorrow's feeds will increase. The B vitamins may be thought of as catalysts which form a constituent part of an enzyme molecule, he said. The latter is necessary for the metabolism of protein and fat and for the conversion of carbohydrate sources into energy.

The present usage of vitamins in poultry feeds has been dictated to a very large extent by the fact that ingredients which contain liberal quantities of vitamins such as wheat middlings, wheat bran, rice bran and others have been eliminated from poultry feed formulas due to a low energy content, he noted.

A new vitamin will be isolated, synthesized and evaluated for feed usage in the next 12 to 24 months, Dr. Couch forecast. "The speaker has crude crystals of such a compound in the laboratory at the present time," he said. "For example, all of the growth promoting activity in 50 lb. of crude supplement may be extracted, fractionated and concentrated to less than ½ gram under carefully controlled conditions. Such concentrated crude crystals have been found to promote a growth rate increase in turkey poults in the range of 12-15% when added to a diet complete in known nutrients. Further research is in progress on the widespread occurrence of this factor."

PRESENT STATUS OF FEED ADDITIVES FOR BEEF CATTLE—Dr. W. M. Beeson, Purdue University, pointed out that any generalization with respect to the effect of different feed additives for beef cattle would be incorrect and misleading; and, also, averages of experimental data do not always present a true picture.

"There are marked differences in the response of cattle to feed additives depending on sex, drylot or pasture, growing or fattening rations, type of grain fed, length of feeding period, disease level and environment," he said. "Interpretations have been made on the basis of the data existing at the present time, but in several instances, more critical research needs to be conducted to study the mode of action of certain feed additives."

Dr. Beeson presented a discussion of the present status of several additives. His report was essentially the same as the one he presented at the Indiana Grain & Feed Dealers Assn. convention and which was summarized in the Jan. 30 issue of Feedstuffs, page 102.

ILLINOIS

(Continued from page 1)

chicks seem to require in variable amounts."

Talks Summarized

Following are detailed summaries of some of the talks presented during the conference:

THE SELENIUM - VITAMIN E ENIGMA—Determining the requirements of domestic and laboratory animals for vitamin E and selenium and the functional interrelationship between these two nutrients is one of the most interesting—and complex problems in nutrition today, according to Dr. H. H. Draper of the animal science department.

Dr. Draper noted that the primary symptom of vitamin E deficiency in growing animals is muscular dystrophy and in mature animals, sterility.

He pointed out that because of its ability to prevent white muscle disease in certain areas, "within a short span, selenium has emerged from nutritional obscurity to be recognized not only as a nutrient that is essential for animals, but also as one that is of practical value in livestock production."

The interrelationships between selenium and vitamin E remain obscure, he noted. But it appears that selenium deficiency leads to certain symptoms that are specific for this element (e.g., exudative diathesis) and others that are similar to those caused by vitamin E deficiency (e.g., white muscle disease).

"The reason these two nutrients are apparently interchangeable in certain situations (i.e., in some instances of white muscle disease) remains to be determined," Dr. Draper said.

Dr. Draper also pointed out work that has been done on the extent vitamin E may be replaced by certain synthetic antioxidants.

"Experiments with commercial antioxidants indicate that certain of these compounds can effectively replace vitamin E with respect to all of the major symptoms of vitamin E deficiency, including muscular dystrophy, sterility, encephalomalacia and necrotic liver degeneration," he said. "Thus, it appears likely that the vitamin E requirement of animals represents a need for a biologically active antioxidant. Of the synthetic compounds tested to date, N,N'-diphenyl-p-phenylene-diamine (DPPD) and Santoquin (1,2-dihydro,6-ethoxy-2,2,4-trimethlyquinoline) have been found most effective."

THE ROLE OF FATTY ACIDS IN RUMINANT NUTRITION—"The volatile acids produced as a result of fermentation in the rumen contribute immensely toward the nutrition of the animal," C. L. Davis of the dairy science department pointed out.

Without doubt, he said, their major contribution is energy, which appears to be utilized at various efficiencies, depending upon the specific purpose for which it is used and the proportions of the acids presented to the tissues for metabolism.

"Although present data indicate that the proportions of acids available to the animal may be used as a guide in predicting the response to a certain diet, more basic information is needed concerning the metabolism of the fatty acids before well-grounded predictions can be made," Mr. Davis noted.

He pointed out that, for many years after the first demonstration, the carbohydrate fraction of the diet fermented in the rumen and subsequently formed volatile organic acids, and it was believed that these acids were waste products and had little nutritional value.

"But," he noted, "it has now been established that the volatile fatty acids (VFA) play a key role in the nutrition of ruminants."

NUTRITION AND HEART DISEASE—The role of nutrition in atherosclerosis was discussed by Dr. F. A. Kummerow, food technology department. Atherosclerosis, he said, is the leading cause of heart disease.

"It seems advisable to eat a well-balanced diet including foods of animal protein sources," he told the group, "such as meat, milk and eggs, with an abundance of fruit, vegetables, bread and cereals to furnish adequate calories for body maintenance. In the meantime, the large amount of money that is now being poured into unproved therapy would serve a more useful purpose in research."

AMINO ACID CONSIDERATIONS IN SWINE REACTIONS—Tryptophan and lysine are the primary amino acids required to supplement corn for swine, according to Dr. D. E. Becker, animal science department.

Dr. Becker said, "Those of lesser importance, such as methionine, isoleucine and threonine, are ordinarily provided in sufficient amounts if the supplementary protein satisfies the requirement for tryptophan and lysine.

"Soybean meal is an outstanding source of supplementary amino acids for feeding swine. Although soybean protein is marginal in sulfur-bearing amino acid content, recent studies have failed to demonstrate that a fortified 16% protein ration consisting of corn and soybean meal is improved by supplementary methionine. The excellent distribution of amino acids in soybean meal, coupled with its low cost, has made it the most popular source of supplementary amino acid in swine rations.

"The possibility of cheaper supplies of crystalline amino acids, particularly lysine, has stimulated interest in their value for swine rations. It is suggested that the supplementary value of soybean protein in a corn-soybean meal ration could be extended by adding lysine, and possibly methionine. Such additions would permit the weanling pig and the finishing pig to be fed lower protein rations that require less soybean meal than is currently recommended."

Dr. Becker said that a series of studies were conducted recently at the University of Illinois to determine the value of low-protein (fortified corn-soybean meal) rations supplemented with various combinations of crystalline amino acids for growing-finishing swine. The results of these experiments were discussed.

Dr. A. H. Jensen, animal science department, said that average analysis values of the amino acid content of milo (sorghum grain) would suggest that lysine and methionine are the primary limiting amino acids in this feed for meeting the apparent needs of the 100 lb. pig.

"Phenylalanine and threonine would appear to be marginal in quality," he told the group. "Thus, supplementing milo with one or more of the aforementioned amino acids should improve feeding value to the degree that the available quantity of each amino acid approaches the pig's requirements."

Dr. Jensen said that four experiments have been conducted with pigs weighing initially about 120 lb. Different levels of lysine and lysine in combination with methionine and/or threonine were added to a diet of milo fortified with vitamins, minerals and antibiotics.

"Results indicate lysine to be the primary limiting amino acid," he explained. "When supplemented with 0.25% lysine and pelleted, a milo ration produced gain and feed efficiency comparable with those of corn-soybean meal or milo-soybean meal 12% protein rations."

AMINO ACID CONSIDERATIONS IN POULTRY RATIONS—Dr. D. J. Bray, animal science department, noted that corn and soybean protein are the major sources of amino acids in most high energy laying rations.

"Recent reports," he said, "indicate that the amino acid pattern of corn-soya laying diets is such that protein levels below those recommended by the National Research Council appear to be adequate despite the high energy content of such diets. For this reason it appears necessary to feed corn-soya laying diets at protein levels considerably below the recommended 15% level in order to critically evaluate amino acid patterns."

Dr. Bray explained, "As the protein level of corn-soya diets is varied, the pattern of amino acids varies simultaneously. Therefore, the results obtained by altering the protein level reflect two variables, protein quantity and protein quality. When graded combinations of corn and soybean protein were fed at suboptimal protein levels in isonitrogenous diets, performance was maximized when each source supplied approximately 50% of the protein. When either corn or soybean meal was the major amino acid source, egg production and body weight were lowered. Thus the minimum deficiency of any single amino acid apparently occurred at the 50-50 combination of corn and soybean protein. Presumably the amino acid imbalance of the corn-soya diet in which corn was the major source of protein differed from that in which soybean meal was the major source.

"A better understanding of the amino acid patterns over a wide range of corn and soybean protein combinations should provide, first, a basis for partitioning protein quantity from protein quality effects and, second, a more precise criterion for selecting amino acid sources to supplement corn-soya laying diets," Dr. Bray said.

AMINO ACIDS IN FEED FORMULATION—PRESENT AND FUTURE—As a general rule, amino acids must "earn their way" into the formula in competition with natural protein sources of these amino acids by lowering production costs, according to Dr. R. O. Nesheim, manager of livestock feed research for the Quaker Oats Co., Barrington, Ill.

Dr. Nesheim cited research on swine and poultry to back up his statements.

"It appears, at this time that methionine may be economically added as the amino acid today, while the use of the amino acid lysine is not economical," he said. "It is apparent from looking at the cost of 1 lb. of amino acid from natural protein sources that lysine is supplied at a rather low cost per pound compared with methionine."

In speaking on the future use of amino acids in feed formulas, Dr. Nesheim said, "With only methionine and lysine currently available, the extent to which amino acids can be used as a replacement is severely limited."

Dr. Nesheim pointed out research that indicated that supplementation with only lysine and methionine will not be satisfactory in meeting the requirements of the weanling pig when the protein level is below 12%.

"Several other amino acids appear to become deficient or borderline at this point," he said, "namely, threonine, tryptophan, isoleucine and histidine. Thus more extensive substitutions of amino acids for protein sources, such as soybean meal, would depend upon the availability of additional amino acids. As more and more amino acids are required to be used, the problem of their competing economically with high-quality natural proteins as a source of amino acids will become more acute."

RADIOACTIVE FALLOUT AND OUR FOOD SUPPLY—"Present lev-

Chicks Placed in Principal Broiler Areas

(000's omitted)

Week ending	Maine	Conn.	Penn.	Ind.	Ill.	Mo.	Del.	Md.
December 5	912	420	600	576	74	676	1,904	2,053
December 12	891	378	847	628	106	695	1,747	2,234
December 19	1,012	404	644	571	101	644	1,840	2,170
December 26	930	388	663	637	75	611	1,530	2,140
January 2	1,093	380	913	664	102	657	1,818	2,335
January 9	1,116	451	946	809	130	745	1,940	2,428
January 16	1,045	424	663	722	100	848	2,049	2,230
January 23	1,054	357	656	665	94	885	1,884	2,245
January 30	1,076	418	666	749	117	715	1,980	2,300
February 6	1,035	422	805	787	120	822	1,925	2,261

Week ending	Va.	W. Va.	N.C.	S.C.	Ga.	Fla.	Ala.	Miss.
December 5	1,024	401	2,354	328	5,381	148	2,772	2,038
December 12	1,056	346	2,506	332	5,506	177	2,711	1,944
December 19	987	368	2,597	324	5,642	198	2,770	1,996
December 26	610	346	2,275	299	4,824	165	2,641	1,843
January 2	1,112	440	2,956	365	5,983	190	2,862	2,267
January 9	1,034	436	2,866	361	6,181	234	3,019	2,160
January 16	1,086	471	2,847	321	6,319	208	3,153	2,207
January 23	1,123	539	2,787	338	6,456	209	3,277	2,149
January 30	1,128	500	2,823	349	6,765	172	3,280	2,420
February 6	1,114	560	2,923	396	6,799	182	3,464	2,352

Week ending	Ark.	La.	Texas	Wash.	Oregon	Calif.	Total 22 areas 1959-60	Total 22 areas 1958-59
December 5	3,192	358	1,771	282	204	1,142	28,408	29,306
December 12	3,140	290	1,725	319	154	960	28,692	29,967
December 19	3,021	319	1,748	281	188	1,042	28,911	30,579
December 26	2,770	235	1,409	229	158	1,011	25,789	29,019
January 2	3,334	355	1,759	287	255	1,046	31,173	31,704
January 9	3,261	425	2,043	355	233	1,152	32,325	30,827
January 16	3,450	428	2,173	320	254	1,033	32,383	29,761
January 23	3,484	372	2,112	311	260	1,151	32,408	30,661
January 30	3,578	383	2,175	378	259	973	33,184	31,343
February 6	3,617	401	2,329	407	249	1,119	34,089	31,837

els of additional radioactivity in our food supply are probably so small that we do not need to be unduly alarmed," said Dr. B. L. Larson, dairy science department.

"However," he said, "a tremendous potential problem does exist, and it is important to determine how these radioactive materials get into our environment and how significant they are. This information is necessary in order to decide whether the testing of atomic devices should continue, what to do in the event of an atomic war, how to cope with radioactivity resulting from peacetime uses, etc.

"At present, the levels of radioactive contaminants in foods have caused no major economic problem except possibly in some milk-producing areas where there has been undue emphasis on milk because of lack of proper information on other foods in the diet.

"The present level of Sr-90 contamination in our diet is perhaps 5-25% of the permissible intake level. If this intake level should rise to the point where it is approaching or exceeding the permissible level, then many problems may arise. It may be necessary to count the Sr-90 and calcium in our diets as we now count calories or vitamin units, etc. It is possible that crops could be bought and sold on a Sr-90 content basis in addition to type and other classifications."

ANOTHER LOOK AT VITAMIN A IN CATTLE FEEDING—Dr. A. L. Neumann, animal science department, told the group that vitamin A deficiency in fattening beef cattle is of considerable importance at present if the number of inquiries about this condition can be used as a guide.

"Reports of this condition are coming from veterinarians, feed company servicemen, salesmen and feeders themselves," Dr. Neumann said. "At first thought one might be inclined to say that these cases have been erroneously diagnosed, especially when the rations often contain large quantities of corn silage or hay of at least average quality along with a full feed of corn. Furthermore, only a few areas from which Corn Belt feeders buy their feeder cattle have had any serious drouth during the past few years. Therefore it is safe to assume that body stores of vitamin A have been at least normal."

Dr. Neumann commented, "If the increasing number of reported cases of A-deficiency in the field was not enough to stimulate our interest in this subject, a case of apparent A-deficiency in our own experimental cattle was."

Dr. Neumann gave a description of the progress of the deficiency in cattle. "We obtained 30 steer calves from the west Texas range area in the early fall of 1958. The calves averaged about 400 lb. when delivered and were in above average flesh and bloom, indicating good forage conditions in the area where they were raised. For about six weeks they were used in a shipping fever study, where they either received a full feed of good legume-grass silage or were run on good pasture.

"From Nov. 11 to March 3, 112 days, they received a full feed of good corn silage, supplement and hay in an antibiotic study. Gains were good, amounting to an average of 1.74 lb. daily. Then for 56 days they were used in a test to study the feeding value of high-moisture corn. The ration consisted of a full feed of either dry or high-moisture shelled corn, and supplement and good legume-grass hay. Again performance was excellent, average gain being 2.37 lb. daily.

"After the conclusion of this test, a trial was initiated on May 5 to study the effect of frequency of feeding. The complete mixed ration consisted of 64% ground shelled corn, 10% soybean oil meal, 1% alfalfa meal and 25% ground corncobs. The alfalfa meal, at the rate fed, supplied at least the equivalent of 7,000 IU of vitamin A. For the first 56 days of this test, daily gains were acceptable, 2.07 lb., and all calves consumed an average of 20.1 lb. of ration daily.

"At about this time voluntary feed intake was rather dramatically reduced in about half of the steers. Upon careful examination it was observed that several of the steers were showing most of the symptoms of classical vitamin A deficiency," he said.

Dr. Neumann said that during the next 56 days, the 30 calves gained only an average of 1.28 lb. daily, and daily feed intake was reduced to 18.7 lb. Some steers actually lost weight, but others performed normally. Examination of the blood plasma showed that vitamin A alcohol content was down to an average of 20.3 mg. per 100 milliliters of plasma, indicating a real A-deficient state.

"Here we have an A-deficiency case in feeder cattle which," he said, "according to all previous experience, should not have occurred. A number of questions arose: Did either the corn silage or the high-moisture corn, or both, contain substances that interfered with carotene conversion or metabolism? Did the stilbestrol implants used on these calves increase the A requirements? Did some component in the ration cause oxidation of the carotene in the complete ration?

"While we have not found the answer to the cause of the A-deficiency in these calves, we have obtained valuable information on the comparative efficacy of carotene from alfalfa meal and stabilized synthetic A in a dry carrier. When these two A supplements were fed at comparable levels (21,000 units daily), synthetic dry A was at least twice as efficient as alfalfa meal carotene in restoring blood and liver A values, and slightly better in restoring appetite and weight gains. Massive doses (100,000 units daily), of synthetic A for 14 days restored gains to normal and increased gains during this period by 65% over those at the same level of natural carotene in alfalfa meal."

EFFECT OF ENERGY INTAKE ON REPRODUCTIVE PERFORMANCE IN DAIRY CATTLE—Research concerning the effect of low and high energy intake on heifers was discussed by Dr. N. L. VanDemark, dairy science department.

Dr. VanDemark said puberty occurred at a fairly constant weight (616±77 lb.), although the ages at puberty varied widely for different planes of nutrition in tests at Cornell. In the underfed animals, puberty was delayed until body size was attained. High energy intake hastened puberty.

Feed level had no effect on the number of services required for the first pregnancy in the Cornell trials, according to Dr. VanDemark. He also said that as a result of the delayed growth, due to restricted energy intake, the underfed heifers were much smaller at first calving than those of the medium and high-level groups. Even though their calves were smaller, many of the underfed heifers had difficulties at calving time, and more calves were lost.

ENERGY EVALUATION OF FEEDS FOR SWINE—"There is a great need for accurate data on the distribution of energy in feed commonly used in swine feeding," declared Dr. D. E. Becker of the animal science department.

"However," Dr. Becker added, "this research is complicated by the existence of several methods of obtaining and expressing energy values of feeds."

Dr. Becker noted that Diggs et al. used the general method of Fraps and Carlyle to determine the productive energy value of lactose for the young pig. "This method was not satisfactory," Dr. Becker said.

Although there is no apparent reason for the wide variation in the maintenance requirement, Dr. Becker said, "it seems unlikely that the technique merits further study for its application in determining the energy value of swine feeds."

Dr. Becker noted that recently Diggs et al. conducted a series of balance studies to determine the metabolizable energy value of feeds for the young pig. The values were determined by feeding each test material in addition to a control mixture formulated to provide adequate amounts of all nutrients except energy.

Since pigs receiving diets containing about 40% protein excreted 6.77 calories in the urine per gram of urinary nitrogen, he said, this value was used to correct all metabolizable energy values for nitrogen retention. The following table, presented in Dr. Becker's talk, describes the values reported:

Feedstuffs	Metabolizable energy Cal./gm.
Corn starch	3.61
Dextrose	3.26
Ground yellow corn	3.25
Ground wheat	3.08
Ground oats	2.68
Rolled oats	3.47
Ground milo	3.07
Wheat bran	2.18
Alfalfa meal	1.30
Corn oil	7.30
Lard	7.54
Stabilized tallow	7.83
Lactose	3.34
Dried whey	2.93
Meat and bone scrap (50%)	1.56
Menhaden fish meal	2.70
Tankage (60%)	2.07
Soybean meal (50%)	3.39

At the Illinois station, a simple biological method has been used to assay the available energy value of feedstuffs, Dr. Becker pointed out. In general, this method involves feeding weanling pigs adequate amounts of all essential nutrients, except energy. When graded levels of a reference material, corn starch, were fed, the gain in weight was proportional to the number of calories fed. The gain responses to assay materials were determined, and the calories equivalents were calculated from the reference curve.

COCCIDIOSIS AND THE ROLE OF COCCIDIOSTATS—"Immunity provided by coccidiosis is always 'species specific,' and the various species of coccidia differ with regard to their sensitivity to currently available drugs," said Dr. Alexander Zeissig, director of veterinary research for Merck, Sharp & Dohme research laboratories, Rahway, N.J.

Dr. Zeissig described coccidiosis as a "self-limiting" disease. "Birds either develop an immunity or die," he said.

"There are three requirements for the sporulation of oocysts—adequate moisture, favorable temperature and abundant oxygen," he said, adding that "moisture is the most critical of these, as evidenced by the fact that coccidiosis is a much more serious problem in moist than in dry climates."

"Flock management and immunization are primary mechanisms to counteract development of coccidiosis in a flock," he said. "The most popular method of preventing coccidiosis in poultry has been the incorporation of a coccidiostat or a coccidiocide in the feed. For the most part, this approach has been successful. Failures have been due to several factors. The simplest failure is a buildup in numbers in the environment to such a point that the coccidiostat was overpowered by the parasite."

A second factor, the scientist said, is variation in anticoccidial spectrum. "For example," he said, "sulfaquinoxaline is most effective against E. maxima and E. acervulina, least effective against E. tenella. 'Glycamide' is a mirror image of this. Nicarbazin has the narrowest range of susceptibility levels of all the coccidiostats yet discovered. This means that, at the .125% use level, Nicarbazin is most effective in covering all species of coccidia."

Most coccidiostats seem to have a useful field life of three to five years if they are extensively employed, Dr. Zeissig said. "The principal reason for this is that," he explained, "under individual farm conditions many situations favorable for the emergence of drug resistance or drug fastness occur. With some drugs several years may pass before this detracts from the general use."

ROLE OF GLYCINE IN CHICK NUTRITION—One of the amino acids that chicks seem to require in the most variable amounts is glycine, according to Dr. H. M. Scott, animal science department.

Dr. Scott said that although the chick can synthesize appreciable amounts of glycine, this amino acid is classified as an essential one, since the rate of synthesis is not sufficient under all conditions to meet the chick's requirement.

"The work of Snetsinger (1959) at Illinois may help to explain why the glycine requirement of the chick is so variable," he said. "He was able to demonstrate that 2% supplemental glycine would alleviate to a large degree the growth depression that resulted when a soybean meal-cerelose diet contained excess supplemental lysine. Glycine also alleviated the toxicity induced by excess dietary phenylalanine. Snetsinger concluded that glycine functions to remove excess amino nitrogen from the body.

"More recently Waterhouse (1960) has demonstrated that chicks fed a casein diet not imbalanced with supplemental amino acids continue to respond to glycine at levels of 3-4% of the diet."

MARKETS

(Continued from page 2)

was not confined to the hog, cattle or poultry categories individually.

South Central

No particular change has occurred in formula feed demand this week. Mill operating time varies between four and five days but the output is not always up to the usual standards. Most feed manufacturers seem to have accepted the present slack rate of business as the result of the usual February pessimism.

Weather during the week has added to the pessimism. The days have been dark and gloomy, highlighted by frequent periods of drizzling rain with only brief appearances of the sun. Certainly this has not been the kind of weather that will help the farmer solve his big headache of wet corn.

Some small signs of hope were seen in the ability of the hog market to remain above $14. While no big improvement in hog feed deliveries was foreseen, the expectations were for a modest increase in takings. But all agree that the best hope for any sustained pickup in demand awaits the opening of the spring feeding season.

Ohio Valley

Considerable rainfall during last week served to raise the underground water table to its highest late winter level in several years, thereby easing the perennial summer drouth threat in the Ohio Valley. But the warm rains have not been at all helpful to the formula feed business, which is continuing the very sluggish movement noted during previous weeks of this year.

With fields deep in mud, it is impossible, of course, for farmers to perform any of their customary seasonal chores. Instead, they must be content to sit beside their radio and television sets, to hear the none-too-encouraging farm reports about current marketing conditions.

Last week, the Federal Agricultural Marketing Service reported that egg prices in valley markets hit their lowest level in 20 years, with farmers losing 4¢ doz. on sales to wholesalers. Feed manufacturers said this situation was due largely to the unusually mild weather to date this winter, which has brought about a much higher than usual egg production.

With heavy receipts continuing at area stockyards, cattle, hogs and sheep are in such plentiful supply as to offer no incentive for a price upswing for these meats. As a result, area feed manufacturers are mostly continuing their 4-day work schedules, with some plants operating less than 8 hours daily so as to provide at least partial employment for their workers.

Mountain States

Formula feed dealers report this week that their sales volume has dropped off a little bit from the previous week, and the over-all volume is down somewhat.

They are not very busy at the present time, but volume always seems to drop off at this time of year and it is still comparable to the same time a year ago.

Cattle feed and dairy feeds are getting all of the demand now, and are the only ones that amount to anything in volume at this time of year. The markets right now seem to be a little sloppy and business in general below capacity.

Pacific Northwest

A fair movement of formula feeds was reported this week, with the trade indicating that dairy ration sales were about unchanged with the previous period while poultry feed lines showed a slight expansion.

Feedstuffs prices showed a further weakness for soybean meal and whole corn. Alfalfa hay prices at Portland and Seattle were barely unchanged to $1 a ton lower.

Feed ingredient trading was on the moderate side. Feeders and mixers limited purchases to immediate needs. Offerings of most items were adequate to plentiful.

The general demand for all offerings of alfalfa hay averaged slow, with buyers showing price resistance, with a tendency to purchase only enough to meet bare requirements.

Warm weather prevailed over the Pacific Northwest and was accompanied by rain showers to the extent that the outlook for early spring pasturage appeared quite favorable.

Soybean meal prices closed mostly $2 ton lower with offerings ample and demand moderate.

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Insurance Fieldmen To Meet Feb. 22-25

CHICAGO—Fieldmen of insurance companies who inspect flour and feed mills and grain elevators will join with engineers of the Mill Mutual Fire Prevention Bureau at Chicago in the 51st annual meeting of the Fieldmen's Assn., at Hotel LaSalle, Feb. 22-25.

The opening address will be by Elmer A. Domke, president, Millers National Insurance Co., Chicago. Following will be an address by William S. Gray, III, assistant manager, financial and economic research department, Harris Trust & Savings Bank, Chicago.

A special feature will be the premiere showing of the Mill Mutual film, "Fire Fighting in Country Elevators."

Discussion and study throughout the four days will cover the ways and means to prevent fire loss to mills and elevators, in line with the purpose of the organization, "To save the grain that feeds the nation."

Scheduled discussions include time element coverage analysis, arson problems, recent court decisions involving property damage, loss trends, financial statements, grain driers, fundamental electrical inspections, liquid fertilizers, feed supplements, physical inspection, casualty insurance, flat storage and dust explosions.

C. F. EASTMAN DIES

WEARE, N.H. — Charles F. Eastman, 77, director of Merrimack (New Hampshire) Farmers Exchange, Inc., poultry and livestock feed manufacturer in Bow, and operator of grain and farm supply stores throughout New Hampshire, died at his home here Feb. 6.

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